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ACCOUNTING FOR PRICE CHANGES:
A CRITICAL ANALYSIS

by



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A THESIS

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The undersigned certify that they have read,
and recommend to the Faculty of Graduate Studies for
acceptance, a thesis entitled ACCOUNTING FOR PRICE
CHANGES: A CRITICAL ANALYSIS submitted by Gurdarshan
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the degree of Master of Business Administration.

ABSTRACT

External financial reports should enable shareholders, creditors, and prospective investors to evaluate management and help them in predicting the income of the entity in the immediate future. But the historical cost basis of accounting currently employed in Canada does not always provide useful information because of its failure to account for changes in the purchasing power of the monetary unit. It fails to (1) provide comparability in successive financial statements, (2) account for gains and losses in purchasing power on monetary items, and (3) make a clear distinction between invested capital and income. An analysis of current operations is difficult to make because financial data is not stated in constant and current purchasing power. Therefore, financial statements ought to be adjusted for price level changes.

Price level adjustments may be made (1) for general purchasing power fluctuations in an economy, or (2) for specific price variations. Adjustments for general purchasing power in Canada may be achieved with the aid of Gross National Expenditure Implicit Price Deflator Index or the Consumer Price Index. The implicit price index adopts a community approach to the problem, while the Consumer Price Index adopts the proprietary idea. But for the benefit of external financial statement users it is preferable not to account for the consumption purchasing power of any particular group, but to account for the interests of the entity.

Adjustments for specific price variations could be in terms of the current cost of an asset of equivalent service, in terms of market buying prices or with the aid of specific price indices. Several specific price indices are available for Canada: (1) The Building Materials Price Index, (2) Index Numbers of Average Wage Rates, (3) Industry Selling Price Indexes, (4) Price Indexes of Electrical Utility Construction, and (5) Price Indexes of Highway Construction in Canada. It should be noted that these indices are broad averages. Current market buying prices or the current cost of an asset of equivalent service may be used in lieu of specific price indices, when these are available. An investment purchasing power index of the firm may be used to adjust monetary items. Replacement value accounting as applied in some European countries is not recommended in Canada because it does not restrict the nature of the subject to accounting for only those assets presently in use. Therefore it is suggested that financial statements should be adjusted for specific price level changes. This will hopefully provide useful economic information to external financial statement users.

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CHAPTER I

INTRODUCTION

As the objective of measurement is to provide an interpretable indication of the magnitude of a property under specific conditions (as at a stated date, in accounting) the scale employed throughout the measuring is necessarily a scale relevant under those conditions.

In brief no analysis of conventional accounting statements can yield sensible conclusions, insofar as those statements contain representations of different properties for different items, and employ scales for different items which vary materially in significance, or in the interpretation which may be placed upon them singly. To overcome this defect, units of differing significance must be transformed into units having the same significance.¹

The use of conventional accounting principles may produce verifiable data, but often fail to provide significant, useful information. Historic cost valuations are often criticized on this basis, primarily because they are past costs. Alternative valuation procedures, which employ the use of current or future costs, are often suggested. In fact, there has been some progress towards the adoption of these procedures.

Related to the valuation procedures is the use of the monetary scale as a criteria for measurement. However, because of the variations in its significance over a period of time, its use is questionable. The correct use of the monetary scale is dependent upon the quantification of the variations in it, over the specified time period.

¹R.J. Chambers, "Measurement and Objectivity in Accounting," The Accounting Review, XXXIX (April, 1964), 267 - 68.

Statement of the Problem

Unstable Dollar

In Canada the dollar is the generally accepted and legal unit of currency. It facilitates the measurement of economic activity and accountants have accepted it as a common denominator in which to 'account for.' The classificatory² nature of the monetary unit has enabled accountants to disregard other properties of goods (units of weight, volume and area) in their economic calculations. The monetary unit's subjective quality of valuations and the ease of its application to arithmetic and statistical operations has facilitated communication³ between different interested parties who like to see a meaningful relationship of events of a commercial venture. The monetary unit, however, accounts in terms of the numerosity of prices. This is where its weakness lies.

Postulate C-4 of the Accounting Research Study No. 1 states that "Accounting reports should be based on a stable measuring unit,"⁴ but the monetary unit is hardly stable. As Chambers says, "The money unit, unlike a physical unit, is not invariant. It is always a unit having significance at a defined time and place."⁵

²R.J. Chambers, Accounting, Evaluation and Economic Behavior (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1966), p. 90.

³L. Goldberg, An Inquiry Into The Nature of Accounting (Iowa City, Iowa: American Accounting Association, 1965), pp. 179 - 180.

⁴M. Moonitz, "The Basic Postulates of Accounting," Accounting Research Study No. 1 (New York: American Institute of Certified Public Accountants, 1961), p. 50.

⁵R.J. Chambers, Accounting, Evaluation and Economic Behavior, p. 80.

A monetary unit, therefore, provides one with a useful relationship between events at a given point of time, and enables one to make a comparison of different commodities at the same time; but it fails to provide a valid and consistent means of comparison of different commodities at different times, or of the same commodity at different times. Its application between two points of time is questionable.

The monetary unit does not qualify as a stable unit. This cannot be proven in any direct way. One cannot go back into time and exchange present dollars with past dollars, but an indirect procedure is available.⁶ We can observe various price indices, which represent a movement in prices of goods and services and, indirectly, measure changes in the purchasing power of money. As the prices of goods and services rise, the purchasing power of the dollar falls; as the price of the goods and services falls, the purchasing power of the dollar rises. Therefore, the prices of all goods and services, and the purchasing power of the dollar, have an inverse relationship.

Figure 1 registers fluctuations in the purchasing power of the dollar for Canada as measured by different price indices.

General and Specific Price Changes

Price changes are of two types: a movement in the general price level, and a movement in individual prices.

A general price level change indicates on the average the trend

⁶Staff of the Accounting Research Division, "Reporting the Financial Effects of Price-Level Changes," Accounting Research Study No. 6 (New York: American Institute of Certified Public Accountants, 1963), pp. 9 - 10.

of prices of all goods and services in the economy. "A general price-level change is a shifting in the economy-wide exchange value of the monetary unit ... it mirrors the change in the purchasing power of the monetary unit as regards all goods and services that might be bought."⁷

A specific price change refers to a movement "in the prices of specific assets such as inventories and fixed assets."⁸ Inventories and fixed assets here refer to each individual item within these groups. It must be noted that prices of each item within these groups may not move in the same direction.

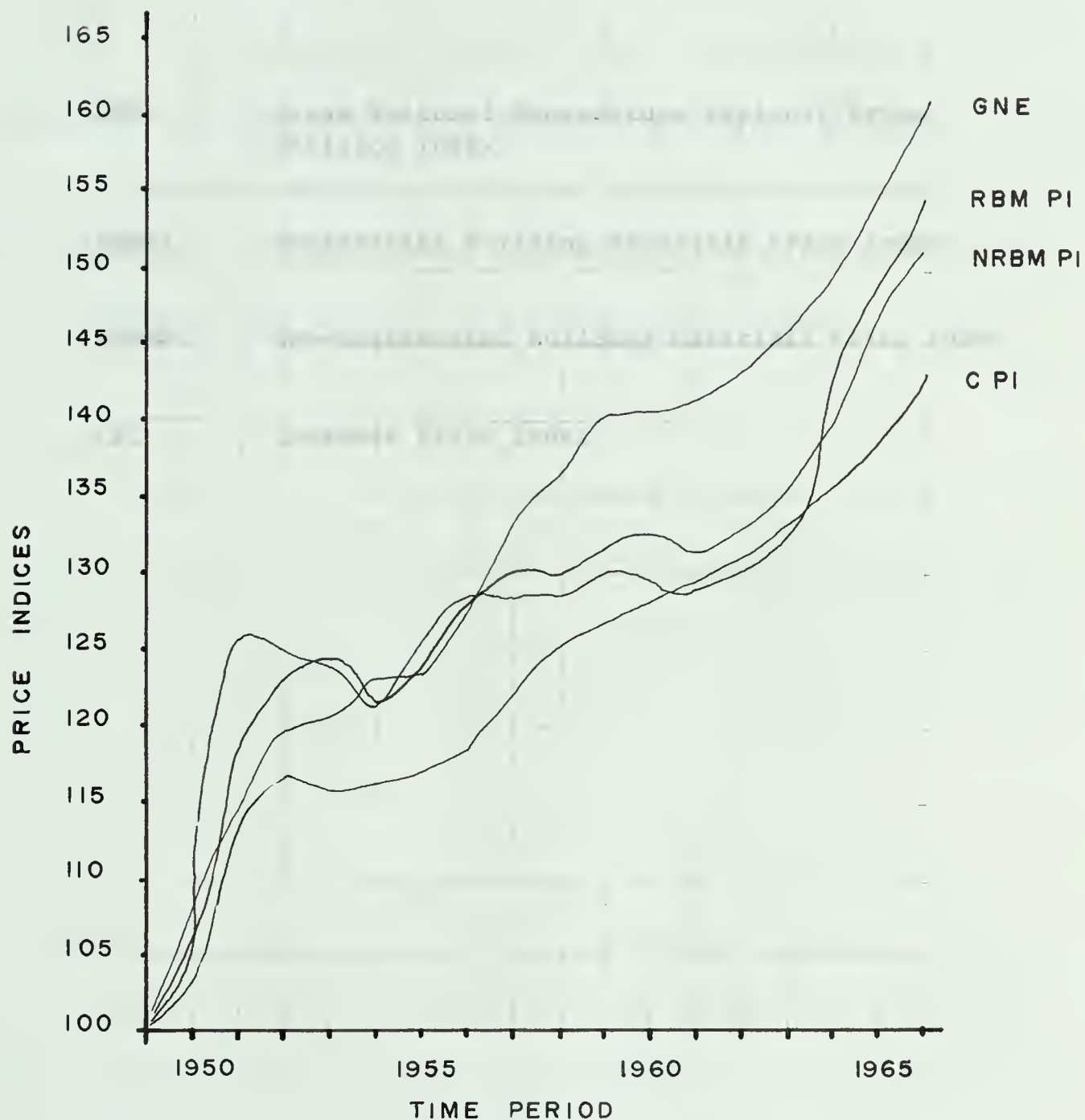
The price movement of specific assets could be due to changes in their supply and demand. Changes in the supply may be due to changes in factor proportions. Changes in demand may be due to the availability of cheaper substitutes or complementary goods, or due to changes in income or tastes of consumers. A specific price change is therefore essentially a change in the supply and demand functions of commodities and may be referred to as a structural price change. A general price level change occurs as a result of changes in the quantity of money in relation to the volume of output of goods and services.

As the general price level changes, movements in specific prices

⁷S.A. Zeff, "Replacement Costs: Member of the Family, Welcome Guest, or Intruder?" The Accounting Review, XXXVII (October, 1962), 612.

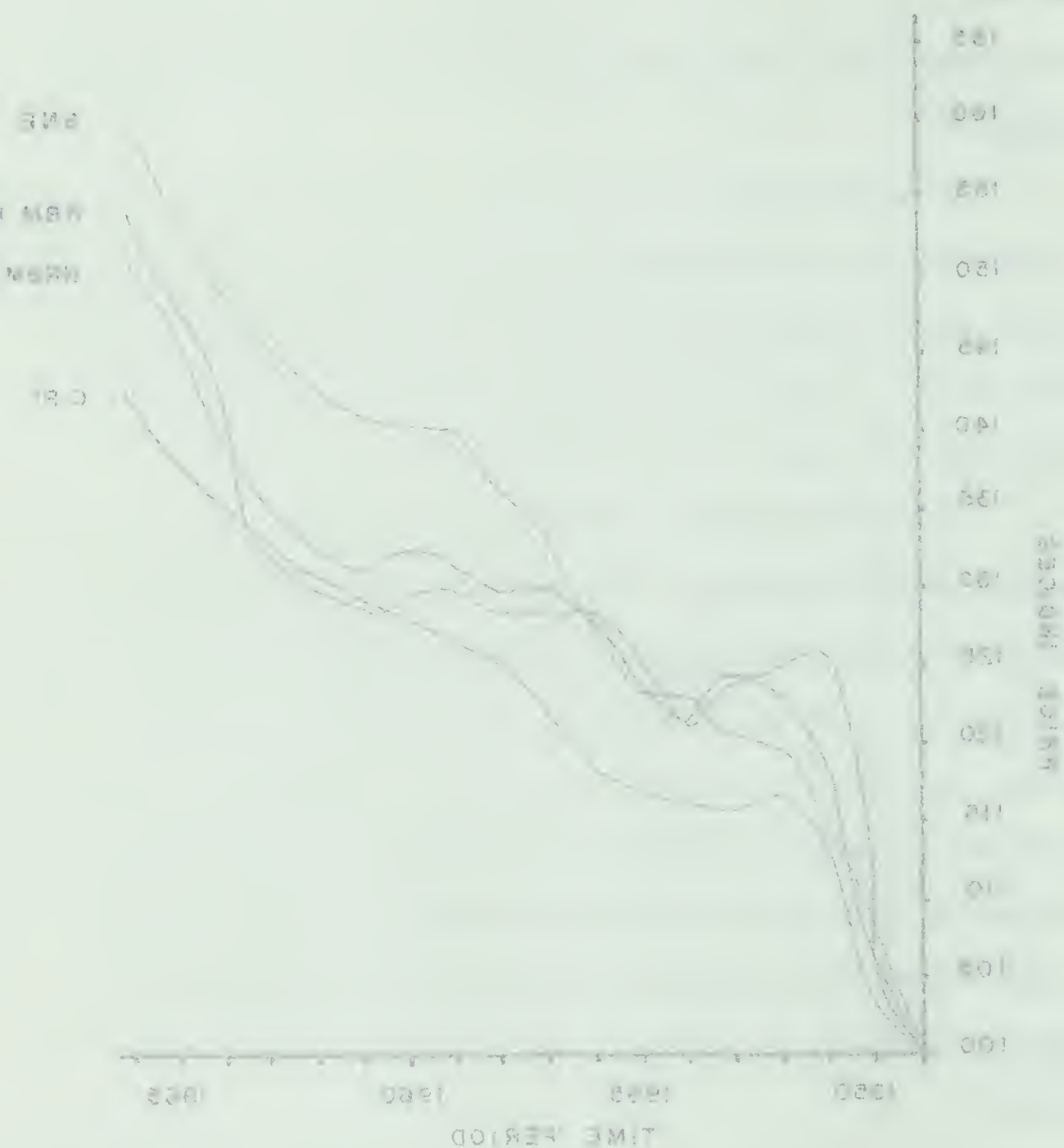
⁸G. Pierson, "Three Kinds of Adjustments for Price Changes," The Accounting Review, XLI (October, 1966), 730.

FIGURE 1
PRICE INDICES FOR CANADA



DATA OBTAINED FROM: CANADA, DOMINION BUREAU OF STATISTICS, PRICE AND PRICE INDEXES, MARCH 1960, pp 16-18; APRIL 1968 pp. 15 AND 21, AND NATIONAL ACCOUNTS INCOME AND EXPENDITURE, 1926 - 1956, p. 37; 1961, p. 58 ; AND 1966, p. 56.

FIGURE 1
PRICE INDICES FOR CANADA



DATA OBTAINED FROM: CANADA, DOMINION BUREAU OF STATISTICS
PRICE AND PRICE INDEXES, MARCH 1950, 1955-56, 1960-61, 1965-66, 1970-71, 1975-76, 1980-81, 1985-86, 1990-91, 1995-96, 2000-01, 2005-06, 2010-11, 2015-16, 2020-21, AND NATIONAL ACCOUNTS INCOME AND EXPENDITURE, 1925-1926, 1931-1932, 1936-1937, 1941-1942, 1946-1947, 1951-1952, AND 1956-1957.

ABBREVIATIONS IN FIGURE 1

GNE	Gross National Expenditure Implicit Price Deflator Index
RBMPI	Residential Building Materials Price Index
NRBMPI	Non-Residential Building Materials Price Index
CPI	Consumer Price Index

occur but the direction and magnitude of these movements may be different. As the general price level rises, the price of a specific asset may rise at a rate higher than the general price level, at the same rate, or at a rate lower than the price level. There is also a possibility that there may be no change in the price of specific assets, or it may be in the opposite direction. An illustration will clarify this. Suppose the general price level is measured by changes in the price of five commodities, and equal weights are assigned to each commodity. Comparing prices of year 2 with year 1 might give us the following changes:

Commodity	Year 2 Prices Compared with Year 1
A	+ 34%
B	+ 10%
C	+ 9%
D	0
E	- 3%
	<hr/>
Total	+ 50%
Average change	+ 10%

This shows that commodities A, B and C have risen in price. There is no change in the price of commodity D and commodity E's price has fallen. The general price level change is ten per cent. Commodity B's price level has risen at the same rate.

To summarize, the problem is best stated by a quote:

Most accounting theorists subscribe to the postulate that the balances in all the accounts of the financial statements of the business enterprise should be quantities of a constant-value unit of measure; the unit of account should be one of stable value through time. The monetary unit does not necessarily qualify.⁹

⁹ J.A. Tracy, "A Dissent to the General Price-Level Adjustment Proposal," The Accounting Review, XL (January, 1965), 163 - 164.

However, a change in the value of the dollar due to a change in the general price level is not a single theoretical problem. There are two distinct problems which are quite different: (1) a movement in the general price level, and (2) movement in individual prices. The question of how changing price levels create a problem for accounting may be answered by saying that, "The major accounting issue created by a changing price level is the accuracy of the measurements of the results of operations and of financial position."¹⁰

Objectives

The objectives of this study are: (1) a critical examination of the relevance of the historical cost concept to accounting in the context of changing price levels; (2) an evaluation of proposals for making price level adjustments; and (3) a review of the price indices currently available in Canada with the view of recommending the use of one or more for price level adjustments.

Scope and Limitations

This is not an all encompassing study of price level adjustments. The main emphasis is on Canadian price indices. The study deals with the available index numbers without getting involved in their technicalities. In addition the theoretical issues of why price level adjustments are necessary, and the proposals put forward by numerous writers are discussed. The study does not illustrate the procedures of adjustment. It is restricted to the theory of purchasing power and capital maintenance ideas.

¹⁰Accounting Research Study No. 6, p. 4.

The study is not concerned with social issues or government attitudes towards price level changes. A discussion of the attitudes of security analysts, investment bankers and investment institutions, or the effects of price level adjustments on the securities market will be avoided.

The study is restricted to the business entity.

Organization

In chapter II an attempt is made to establish the case for change from strict adherence to historical costs. The limitations of historical costs to users of financial statements are stated. As there is no general agreement among advocates of price level adjustments, the theoretical issues of the two main proposals are discussed in chapters III and IV. Chapter III is devoted to the price level adjustment proposals, while chapter IV examines the concept of employing current replacement cost of specific assets.

As both the approaches suggest the use of index numbers to adjust historical dollar costs, (though current replacement costs may be obtained from the market place), chapter V reviews the price indices available in Canada, and gives recommendations on the appropriate indices for making price level adjustments to accounting data. Chapter VI is a summary.

CHAPTER II

SHOULD HISTORICAL COSTS BE RELEGATED
TO A MINOR ROLE IN ACCOUNTING?

Introduction

Historical cost accounting is sometimes defended as a "service necessity,"¹ or as providing a "background of the story of the way in which management has met its responsibilities,"² indicating that management has a stewardship function.

As a "service necessity" accounting should furnish relevant economic information to internal and external financial statement users--managers, shareholders, creditors, employees and labour unions. These groups have legitimate interests in the resources of the enterprise and their ability to provide future economic benefits. It is doubtful that conventional financial statements are of any relevance, other than serving as chronicles of financial transactions.

Financial statement users are also interested in the current disposable purchasing power. But historic costs refer to past market buying prices and purchasing power of the date of transactions. As long as there are no price variations or dispersions, such costs may be relevant. However, it is ridiculous to assume perfect stability of prices over time. Historical costs will not reflect current purchasing power, thus making it impossible to distinguish between original

¹A.C. Littleton, "Significance of Invested Cost," The Accounting Review, XXVII (April, 1952), 171.

²Eric L. Kohler, "Why Not Retain Historical Costs?" The Journal of Accountancy, CXVI (October, 1963), 39.

invested capital and income.

Therefore in this chapter the writer considers whether or not historical costs provide useful economic information, and if they are representative of current purchasing power. The informational needs of external financial statement users are briefly stated. Since there may be some justifications for retaining historical costs, it is reasonable to comment on some of these. Sometimes it is argued that technological changes and frequent fixed asset replacements make it unnecessary to adjust for changes in purchasing power. This proposition and counter arguments to it are also considered.

Justifications for Use of Historical Costs

Objectivity

The prime reason for accounting in terms of historical costs is one of objectivity. "Acquisition costs ... represent a neutral, objective evaluation of the past's contribution to prospective economic benefits."³ Objectivity, however, is difficult to define. It can be said evidence is objective when it is free from personal bias and is verifiable. Paton and Littleton consider objectivity as relating "to the expression of facts without distortion from personal bias."⁴ Moonitz refers to objectivity as evidence "subject to verification."⁵

³ Ibid., p. 38.

⁴ W.A. Paton and A.C. Littleton, An Introduction to Corporate Accounting Standards (Ann Arbor, Michigan: American Accounting Association, 1940), p. 19.

⁵ Maurice Moonitz, "The Basic Postulates of Accounting," Accounting Research Study No. 1 (New York: American Institute of Certified Public Accountants, 1961), p. 41.

This should permit individuals working independently to reach similar conclusions.

Objectivity however is a relative concept. Paton and Littleton recognize this and state that "evidence supporting a given treatment may be completely objective, doubtfully objective, or clearly unobjective."⁶ Therefore, advocates of historical costs have to accept that objectivity does not represent an absolute standard. Financial data may be objective to different degrees. Although one may present well documented acquisition cost data, yet one has to admit that there is a considerable degree of "subjectivity" of judgment and opinions related to historical cost accounting. To

the extent that rules incorporate widely held beliefs, judgments, or criteria of the information processors, the result is not independent of the processors; it loses in objectivity and may communicate signals which are irrelevant to real operations.⁷

Numerous examples of estimates based on judgment and opinions of information processors can be given. Fixed asset cost allocations of depreciation, depletion or amortizations are estimates. Treatment of research and development costs, deferred maintenance, taxation and valuation of inventories are matters of personal opinion. Similarly certain other revenue and expense measurements, such as estimates of bad debts, sales returns and cash discounts add to the elements of subjectivity.

⁶W.A. Paton and A.C. Littleton, An Introduction to Corporate Accounting Standards, pp. 19 - 20.

⁷R.J. Chambers, "Measurement and Misrepresentation," Management Science, VI (January, 1960), 142.

Bias and Errors

Those who wish to maintain the status quo often mention that bias and errors will result from procedures other than those based on historical costs. Manipulations are also possible. The implicit assumption here is that original costs prevent such errors and manipulations in accounting systems. But, the

real danger in financial accounting, however, is that historical cost, widely revered as the most reliable means of objective measurement, facilitates such manipulation or distortion, and confidence in financial statements is therefore necessarily made precarious.⁸

Stewardship

In a large corporation, separation of ownership from control has necessitated periodic reports by management to owners. This is because of the belief that investors are interested in knowing about what happened to their original capital contributions and retained earnings of the enterprise. Therefore financial statements may be prepared for investors in terms of historical costs to show that their original dollar investments have been maintained. However, stewardship may not envisage such a simple relationship. It may have one or more dimensions.

"These range from the most elemental level of custodianship to responsibility for acquisition, utilization, and disposition of resources embracing the whole scope of management functions in a business entity."⁹

⁸Robert T. Sprouse, "Historical Costs and Current Assets--Traditional and Treacherous," The Accounting Review, XXXVIII (October, 1963), 692.

⁹American Accounting Association, A Statement of Basic Accounting Theory (Evanston, Illinois: American Accounting Association, 1966), p. 30.

This broad definition of stewardship implies that investors have to depend upon the judgment and decisions of management for an efficient administration of funds. Under such circumstances investors are not only interested in knowing whether or not their original contributions have been maintained, but also in evaluating management. In fulfilling these needs of investors advocates of stewardship may have to rely on alternative current-cost procedures rather than historical costs.

Other Possible Justifications

Original costs are sometimes defended as necessary for contractual relationships as these require the use of a monetary measure. Similarly regulatory provisions have to be met. Regulatory agencies, stock-exchanges and trade associations specify certain conventions and rules to be adhered to. In addition, government with its tax laws and the requirements of the Companies Acts, influences accounting procedures.

Fear of competition is often stated as a reason for not furnishing current cost data. It is felt that competitive advantage would be lost if other companies in the industry obtain such information.

It is also said that complicated adjustment procedures confuse external financial statement users who lack an understanding of current costs. Accountants will therefore have to assume an additional role of educating them.

Decision makers require objective information which will enable them to make modifications as they please. Financial analysts do not favour any "tampering" with conventional financial statements. They

prefer to make their own mental calculations.¹⁰

Counter-arguments can easily be provided for the preceding justifications of historical costs. With regards to statutory and legal requirements, the accounting profession has substantial influence in their formulation. Rules and conventions of trade associations and regulatory bodies can be altered. Government regulations can be amended and modified by representation. Examples of changes in legal requirements during periods of inflation can be cited from many European countries.¹¹ In most Commonwealth countries, including Canada, legal requirements exist because of practice and not vice-versa. Even if it is not possible to change legal requirements, it is not essential that accounting procedures should be the same for management purposes, as those prescribed by corporate law, or taxation requirements.

Fear of competitors making use of current cost information are unfounded. Financial statements are usually prepared on an aggregate basis, whereas competitors may require information for segments or for divisional lines. In fact competitors often have other means of extracting information, if it is of importance to them.

The problem of the accountants' inability to communicate with

¹⁰See Charles T. Horngren, "Security Analysts and the Price Level," The Accounting Review, XXX (October, 1955), 575 - 581 and Morton Backer, "Financial Reporting and Security Investment Decisions," Financial Executive, XXXIV (December, 1966), 50, 53, 54, 56, 58 and 60.

¹¹See H. Peter Holzer and Hanns-Martin Schonfeld, "The German Solution of the Post War Price-Level Problem," The Accounting Review, XXXVIII (April, 1963), 377 - 381 and H.P. Holzer and Hanns-Martin Schonfeld, "The French Approach to the Post War Price-Level Problem," The Accounting Review, XXXVIII (April, 1963), 382 - 388.

financial statement users may be difficult to overcome. Financial statement users are from diverse backgrounds, and have different levels of understanding, thus making it necessary for accountants to educate some people to understand financial reports. This, however, is not a new problem. Current orthodox reports, too, may not be easily understood. So an assumption that is often made that financial statement users are an intelligent minority is equally applicable when current cost data are presented. This, therefore, should not be an obstacle to restating historical costs in current terms.

Difficulty in preparing adjusted financial statements should not be a hindrance. As Goudekot stated while demonstrating methods used by Philips Company of the Netherlands, which presents results of operations in current purchasing power, "it must be demonstrated that the practical difficulties can be overcome and are not so great as to justify the abandonment of such an important principle."¹²

The argument that a financial statement of sound, conservative, historical facts should be supplied to investors who prefer to make their own mental calculations is justifiable to a certain extent. But, this is valid only under the following two conditions:

- (1) Investors must perfectly understand exactly what degree of objectivity exists in their 'known' historical cost base; and
- (2) investors must be fully acquainted with considerable inside knowledge of the company whose statements they are adjusting; otherwise meaningless modifications to figures will be made.¹³

¹²A. Goudekot, "An Application of Replacement Value Theory," The Journal of Accountancy, CX (July, 1960), 37.

¹³L.S. Rosen, "On the Conflict Between Custodial and Operational Accounting," Cost and Management, XLI (June, 1967), 12.

These two conditions are difficult to meet. Well informed investors and security analysts might succeed to a certain extent, and a correct use of historical cost might be made.

To summarize, historical cost accounting can be justified as necessary for the most elemental level of custodianship. It also satisfies the needs of a certain group of decision makers who require objective historical facts. Objectivity, in fact, is in degree only. Certain subjective estimates are still the basis of historical cost accounting. Bias, errors and manipulations are possible. Rationalizations based on legal requirements, practical difficulties and fear of competitors should not be an obstacle to change. In fact, on the basis of usefulness, relevance or significance of accounting data, it may be necessary to give a minor role to historical costs.

Financial Data and the Needs of External Financial Statement Users

External financial statement users (shareholders, creditors, suppliers, employees and labour unions, security analysts, trade associations and government units) rely on the reported income and the statement of financial position for decision making. Therefore, accountants have to fulfill moral and legal obligations. However, to cater to the informational needs of all groups may be a difficult task. Each group has its behavioral characteristics and may demand precise and definite information, unrelated to the demands of other groups. There is one common ground however. All are interested in the earnings of the enterprise. It is imperative, therefore, that accountants should supply relevant economic information for prediction and make a clear distinction between income and capital of the enterprise.

Shareholders are basically interested in two types of decisions: (1) to appraise the efficiency of management; and (2) to decide whether to retain, dispose of, or to increase investment in a particular firm.

Appraisal of management is important to both shareholders and management. If management fails to live up to the expectations of shareholders, (that is, of high profits), then new officers may be elected; though in practice it is rare for shareholders to exercise this prerogative.

Employees and labour unions are interested in the current, as well as the future, earnings of the enterprise. Employees may want to decide whether they should remain in the employment of the firm or quit. Labour unions try to find justifications for wage demands. They look for growth and profitable operations of the enterprise. Income, measured in terms of historical costs, may not be a useful tool to management in this respect.

Creditors and suppliers think in terms of a line of credit. The amount and the time factor is of importance as payments will have to be made. Therefore, creditors and suppliers look to the future for income and cash generation and are also interested in the collateral security for the supply of funds and commodities.

Decisions of these groups are therefore dependent on future expectations which are based to a certain extent on the present level of profits and the measurement of income. But it is questionable whether a purely financial measure of income can serve a useful function.

Accounting Income and Prediction

The accounting measure of income is derived by matching the dollar amounts of revenues and expenses which are not expressed in the same purchasing power. Revenues may be in terms of current prices, while expenses may be cost allocations of previous periods. Thus input costs of earlier dates may be matched with output revenues of later dates and provide an incorrect computation of income. The dollar amounts of different dates have to be adjusted for their purchasing power if income is to be used for decisions pertaining to the future. Hendriksen lists three reasons why reported income has to be adjusted for changes in price level.

(1) Prediction requires an emphasis on recurring events and an attempt to obtain signs of material non-recurring changes in the future. Although price-level changes may be recurring, they do not recur in a way that can be predicted reasonably. (2) Past income figures may be useful for predicting future income only if all income statement figures are expressed in the same terms. If the purchasing power of the dollar changes, income computed on the basis of historical dollars loses comparability with income of other periods. (3) From the investors' point of view, it is much less meaningful to predict the changes in the money value of the firm and money income than to predict the value of the firm in terms of a constant purchasing power and changes in this total purchasing power. The stockholders will be better off if the total purchasing power of the firm increases, but an increase in the money value of the firm does not mean that they will necessarily be better off if the price level has increased at a more rapid rate.¹⁴

The conventional historical cost measure of income does not provide information to external financial statement users that is helpful in prediction. Statements adjusted for price level changes will serve this purpose better. Such statements will reflect "the impact of environment on the firm beyond the completed transactions.

¹⁴Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois: Richard D. Irwin, Inc. 1965), p. 167.

Thus they possess a high degree of relevance for many uses in which prediction is prominent."¹⁵

The Balance Sheet and Relative Interests of Investors

External financial statement users also refer to the financial position of the enterprise. This is indicated by the point of time statement--the balance sheet. It suggests the relative interests of the shareholders and creditors to the monetary and non-monetary assets to which these groups have claims. But a balance sheet prepared according to the historical cost basis provides an incorrect picture, because it "combines figures that are not expressed in the same kind of measuring unit, thus violating the basic mathematical axiom that 'like added to like gives like.'"¹⁶ The implication here is that ignoring price level changes results in unequal weights assigned to each dollar. Chambers comparing this to measurements based on a number of foreign currencies without conversion at the exchange rate to a common currency, says:

It is just as pointless to add monetary units representing different purchasing power (dollars of 1950, of 1955 and of 1960, when purchasing power of the dollar has continually changed) as it is to add Belgian francs and French francs when they do not stand at parity. To compare any absolute monetary quantities, such as the sales of a firm in 1950, 1955 and 1960 in the above circumstances, without correction for the changed significance of the money unit, would be plainly misleading.¹⁷

¹⁵American Accounting Association, A Statement of Basic Accounting Theory, p. 30.

¹⁶Henry W. Sweeney, Stabilized Accounting (New York: Holt, Rinehart and Winston, Inc., 1964), p. 24.

¹⁷R.J. Chambers, Accounting, Evaluation and Economic Behavior (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1966), p. 95.

Therefore, one can question the mathematical propriety of historical costing and the relevance of original costs to the needs of shareholders and creditors. Only a current valuation of assets can provide a correct measure of collateral security. If the price level has fallen no creditor will rely on original cost. On the other hand if price level has risen, borrowers of funds, or shareholders can make use of their equity.

Evaluation of Current Operations

External financial statement users, while concerned about their relative interests in the enterprise at present and in the future, have to evaluate the firm's current operations. In their current appraisal of the enterprise it is usual for them to make use of a number of ratios. The ratios of sales to receivables, inventories to receivables, and current assets and current liabilities may be useful. For an evaluation of the firm's profitability or for a scrutinization of its capital structure, debt/equity ratio, ratios of net income to debt, net income to equity or net income to total capital may prove helpful. But these can only be meaningful if a unit of measure of the same significance is used for both the numerator and the denominator of the ratio. Hendriksen, criticizing the computation of a rate of return on the basis of current operating profit and total shareholders' investment says:

Current accounting practice does not provide the information by which a useful rate of return can be computed because both the determination of income and the valuation of invested capital are dependent, in part, upon costs incurred in earlier periods at different prices. An accurate calculation of the rate of return,

therefore, requires the adjustment of both income and balance-sheet historical costs.¹⁸

Therefore historical cost financial statements are not helpful to external financial statement users for predictive as well as for current evaluation purposes. In fact, the mathematical propriety of these statements can be questioned. It may be further pointed out that managerial decisions particularly with regards to dividends and pricing may be incorrect. These may affect shareholders adversely.

Managerial Decisions

Dividends

The historical cost measure of income may lead to incorrect decision by management in terms of the declaring of dividends to shareholders. This may be due to the failure to distinguish between invested capital and income. An application of the Hicksian idea of income will illustrate the distinction between invested capital and income.

A man's income can be defined as "the maximum value which he can consume during a week and still expect to be as well off at the end of the week as he was at the beginning."¹⁹ This concept is equally relevant to the business entity, though the idea of well-offness is debatable. When applied to a firm, it means that the entity can pay out as dividends, an amount which will leave its invested capital at the same level at the end of the period as it was at the beginning.

¹⁸Eldon S. Hendriksen, Price-Level Adjustments of Financial Statements--An Evaluation and Case Study of Two Public Utility Firms (Pullman, Washington: Washington State University Press, 1961), p. 8.

¹⁹J.R. Hicks, Value and Capital (Oxford: Clarendon Press, 1939), p. 172.

One can think of invested capital as financial, physical, or equivalent number of purchasing power units.²⁰

Conventional accounting procedures assume that capital is maintained if the amount of invested dollars are the same at the end of the period as the beginning. The concept results in a financial measure of income, and well-off, here means that financial capital is maintained.

Assuming that in period t_0 a firm invested \$1,000 in inventory. Ten units were purchased for \$100 each. By time period t_1 , 8 units were sold for \$150 each, giving rise to an inflow of \$1,200 cash. At the same time, inventory had risen in price per unit to \$120. According to the conventional measures, income is stated at \$400 (\$1,200 - \$800). The firm is well-off by that amount, and financial capital is maintained--accounting 2 units at historical cost plus \$1,200 cash including the \$400 profit available for dividends. But in terms of current costs, profits are only \$240 (\$1,200 - \$960), so as to allow for replacement of inventory at current prices. Willard Graham questions, "Is it sound accounting practice to report that capital investment has been maintained intact and a profit earned, when, in fact, only the number of dollars of investment is unimpaired, while the economic power of those dollars has been constantly shrinking?"²¹

²⁰Jean St. G. Kerr, "Three Concepts of Business Income," in An Income Approach to Accounting Theory, eds. S. Davidson; D. Green; C. Horngren; G. Sorter; (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1964), p. 41.

²¹Willard J. Graham, "Depreciation and Capital Replacement in an Inflationary Economy," The Accounting Review, XXXIV (July, 1959), 367.

A measure of profit should allow for a "provision of recovery of the equivalent of physical capital consumed in operations."²² If an identical unit of inventory is not obtained because of the development of a newer type with slight modifications, and if we still wish to maintain the same volume of business, then we should measure income in terms of replacement cost of those units. This will enable the business to be "well-off" in current purchasing power terms.

The conventional measure of income does not represent current purchasing power. If management declares dividends, then investors cannot be certain whether dividends are out of current income or whether they include a return of capital previously invested. In the above example, if \$400 were declared as dividends, it is tantamount to the repaying of capital, as the firm will not be able to replace the required units of inventory to maintain the same volume of business. Capital requirements will have to be replenished by resorting to the money market. Some might say that management might retain part of the profits to overcome this problem. This is a fallacious argument. Why should a firm show profits and pay taxes on these profits when they are not distributable? Why should a firm legally place itself in a position where the shareholders can claim dividends which may be distributions of capital?

Pricing Policy

For decisions on pricing, current costs are useful to the extent that price may be based on costs. Prices may be determined

²²Willard J. Graham, "The Effect of Changing Price Levels Upon the Determination, Reporting, and Interpretation of Income," The Accounting Review, XXIV (January, 1949), 19.

by competition, or by price-leaders; but in circumstances where "a cost-plus" pricing policy is applicable, for example in case of job orders or contract work, current and not historical costs will be the correct and relevant base to use.

Monetary Gains and Losses

Management also has to be aware of the monetary gains and losses that occur as a result of the firm holding net monetary assets. During a period of rising prices debtors benefit while creditors suffer losses of purchasing power. During the period of falling prices it is the creditors who benefit. This is because the dollar does not represent the same economic sacrifice when prices vary. The economic sacrifice is measured by the purchasing power of the dollar and not by its numerosity. At the time of a business transaction, the economic sacrifice involved equals the amount of money contracted. With a passage of time, a change in purchasing power may result, and the dollar amount of money does not represent the economic resources foregone. The working capital of the business enterprise is made up of assets and liabilities of current monetary nature. Holding monetary assets during periods of rising prices results in losses; while an excess of current liabilities over monetary assets results in gains. Measurement in terms of historical costs does not permit accounting for such gains and losses.

It may be stated that from point of view of usefulness of financial data to internal and external financial statement users, it is recommended that financial statements be adjusted for price variations. However, some may feel that new plant additions may provide a

counterbalancing effect to price increases and the business cycle may also help to iron out some of the price variations. Therefore there is no need for price level adjustments. These views and counter-arguments will now be considered.

Factors Having a Moderating Influence on Price Variations

Technological Innovations and New Plant Additions

Technological progress is characteristic of a dynamic economy. Large business enterprises innovate and introduce more efficient methods of production. These may be in the form of (1) slight modifications in the existing methods of production, or (2) a completely new process. Such changes may lead to large expenditures, but will probably lower the per unit cost of production.

It is maintained by some that increases in productivity because of technological innovations offset the effect of rising prices. As there may be far reaching technological changes, an adjustment for price variations might lead to an excessive elimination of profits and adjustments turn out to be fickle.²³

This, however, is not true. If the idea is to adjust for specific price changes and to maintain the operating capacity of the firm, with a continuous replacement of assets, accounting in terms of current costs takes care of the technological changes.

During periods of constant prices, increases in productivity have never been considered. There is no reason why it should be a

²³Raymond C. Dein, "Price-Level Adjustments: Fetish in Accounting," The Accounting Review, XXX (January, 1955), 14.

problem when prices are variable. When productivity is rising and prices are rising too there may be some reason to believe that it offsets the effect of rising prices. On the other hand, when productivity is rising and prices are falling the problem may be accentuated.

An opinion survey was conducted by the Technical Services Department of the American Institute of Certified Public Accountants in 1957, and one of the questions asked was: "Do you believe that technological changes in productivity of new plants counterbalance the effect of a rising price level?"²⁴ The respondents generally agreed that technological changes do not counterbalance the effects of rising prices. It must be noted that one cannot attach any importance to results of such a survey. Nevertheless, it is indicative of the opinions of a fraction of the accounting profession.

It is sometimes argued that additions to plant and equipment offset price level changes. This is fallacious. The net effect of plant additions offsetting price level changes is dependent on (1) the service life of the assets, (2) the rate of price level change, and (3) the rate at which additions take place. It is not possible that replacement of assets could overcome the problem. Only when assets are replaced at the current price level does the effect of price changes disappear.

In accounting for inventories itself, we notice that effects of price changes are not offset even though inventories are continuously being replaced.

²⁴Technical Services Department of the American Institute of Certified Public Accountants, "Opinion Survey on Price-Level Adjustment of Depreciation," The Journal of Accountancy, CV (April, 1958), 42.

The Opinion Survey once again indicated that although recent acquisitions of plant and equipment reduce the price level problem, yet they have generally been unable to take care of it to a substantial extent.²⁵

Business Cycles and the Price Level

It is claimed that effects of price changes may be ironed out by the business cycle; price may rise and fall in the same magnitudes and offset any price changes. This can be "true only if (1) prices do, in fact, rise and fall by the same magnitude, (2) capital expenditures are evenly distributed throughout the cycle, and (3) the cycle is relatively short in duration."²⁶

It is unlikely that any of these assumptions can be met. As figure I in chapter I shows, since 1949 price indices for Canada have followed an upward trend, there is no indication of offsetting magnitudes of price variations.

Similarly, one cannot be sure of the even distribution of capital expenditures. During an upturn of a business cycle, expansion may be greater than the contraction during a downturn or vice-versa. Therefore, it is difficult to achieve perfect harmony of price-movements and capital expenditures, in order that price level adjustments may not be required.

²⁵Ibid., p. 42.

²⁶Eldon S. Hendriksen, Price Level Adjustments of Financial Statements, p. 112.

Summary

Shareholders are interested in (1) predicting the future flow of economic benefits, (2) evaluation of managements, and (3) knowing their relative position with regards to other investors and interested parties, in the resources of the enterprise. Creditors and other external financial statement users are also interested in future economic benefits. Management while entrusted with economic resources, has the task of not only maintaining but also increasing them for the benefit of shareholders. The increase in resources over and above the investments may be declared as dividends. Such decisions from the point of view of management and shareholders make it imperative that there be a clear distinction between invested capital and income. Conventional historical cost financial statements do not provide a clear differentiation, because historical dollar costs represent purchasing power of different time periods. Therefore there is a need for adjusting financial statements to current costs or current purchasing power.

Historical cost accounting not only fails to provide useful economic information for decision making, but also has other limitations. It fails to disclose the monetary gains and losses, adopts a venture approach, and presents an incorrect financial position of the enterprise.

Historical costs may fulfill very elemental levels of custodian-ship requirements, and may be objective, but they fail to provide useful information.

Some may claim that no adjustments for price level changes may be necessary because technological improvements and new plant additions offset the increasing price level. This is an incorrect argument. Similarly it is illogical to claim that business cycles can help to iron out the effects of price changes.

Therefore on the basis of these arguments and on the basis of relevance and usefulness, historical-cost accounting should not be given a predominant position in financial accounting.

CHAPTER III

THE CORRECTION FOR GENERAL PRICE

LEVEL CHANGES

Introduction

There are two major schools of thought for the solution of the price level problem. One school believes that financial data should be restated by means of the general index¹ of prices, that is, changes in the purchasing power of the dollar. This view is based on the idea that the only defect in conventional accounting is the instability of the unit of measure, and a use of the unit of measure which represents the same amount of purchasing power will correct this. This approach has received considerable support in North America, as exemplified by studies sponsored by the American Accounting Association,² (hereafter the AAA) and the American Institute of Certified Public Accountants,³ (hereafter the AICPA).

¹For an idea of what is meant by a general or a specific index of prices see Appendix A to this chapter.

²Ralph Coughenour Jones, Price Level Changes and Financial Statements: Case Studies of Four Companies (Columbus, Ohio: American Accounting Association, 1955); and Effects of Price Level Changes on Business Income, Capital and Taxes (Columbus, Ohio: American Accounting Association, 1956); also Perry Mason, Price Level Changes and Financial Statements: Basic Concepts and Methods (Iowa City, Iowa: American Accounting Association, 1965).

³The Staff of the Accounting Research Division, "Reporting the Financial Effects of Price-Level Changes," Accounting Research Study No. 6 (New York: American Institute of Certified Public Accountants, 1963).

Accounting Research Study No. 6, published by the AICPA

states:

All elements of financial statements (e.g., balance sheet, income statement, analysis of retained earnings) should be restated by means of a single index of the general price level as of the balance sheet date so that all financial data will be expressed in terms of dollars of the same purchasing power.⁴

The other school believes that accounting can perform its functions only if it states current values or replacement costs of the firm's resources. As Gynther states,

current market prices and specific price indexes of assets held would form the base of an investment index for each firm and the direct use of these indicators of price movements of individual assets could even be more relevant.⁵

There is, however, a third group which does not consider these proposals as mutually exclusive.⁶ Adjustments for both; the general price level changes and the specific price variations, may provide a better answer. This is the view taken by Edwards and Bell, and Sprouse and Moonitz.

It is the writer's belief that accounting for the interests

⁴Ibid., p. xi.

⁵Reg. S. Gynther, Accounting for Price Changes--Theory and Practice (paper presented at the 28th Annual Research Lecture meeting of the Australian Society of Accountants Victorian Division, Melbourne, October 26, 1967), p. 15.

⁶Edgar O. Edwards and Philip W. Bell, The Theory and Measurement of Business Income (Berkeley and Los Angeles, California: University of California Press, 1961), and Robert T. Sprouse and Maurice Moonitz, "A Tentative Set of Broad Accounting Principles for Business Enterprises," Accounting Research Study No. 3 (New York: American Institute of Certified Public Accountants, 1962).

of the entity⁷ will be favourable to the interests of shareholders, creditors and other financial statement users in the long-run. It should be noted here that reference is only to general purpose financial statements. With these views in mind the general price level approach will be considered. Emphasis will be placed on the validity of the concept and the application of the Gross National Expenditure Implicit Price Deflator, the Consumer Price Index and the General Wholesale Price Index to the financial statements of the business entity. The reasons why general price level adjustments may be favoured by some accountants are also critically examined.

The Gross National Expenditure Implicit Price Deflator

The use of one general index measures the effect of inflation or deflation. As the general index is the measure of the general purchasing power of money, it can be considered as the reciprocal of the value of money itself. The general index that reflects the prices of all goods and services of the Canadian economy is the Gross National

⁷The entity concept. A business enterprise--a proprietorship, partnership, or a corporation--is recognized as a separate and distinct organization from the owners or contributors of capital. The owners may not be identified with the business enterprise. The accounting equation for an entity is, the sum of assets equals the sum of liabilities plus equities. The liabilities may also be considered as equities because they represent different rights in the enterprise. Considering the business enterprise as an entity means that earnings are regarded as income of the business and not that of the shareholders until dividends are declared. Interest payments on debt are considered as distributions to equity holders and retained earnings are equities of the enterprise and not those of shareholders. The entity being a separate and distinct organization has its own sets of objectives of survival and growth and there is a need for presenting external reports for the benefit of investors, creditors and other interested groups.

Expenditure Implicit Price Deflators (hereafter the implicit price deflators). It encompasses the entire economy including the foreign sector and is imputed by dividing the total of current dollars by the total of constant dollars.

The advocates of such an index subscribe to a particular view of capital maintenance and profit measurement. They wish to maintain the ability of the firm to purchase an equal quantity of goods and services of a general nature, and the firm is "well-off" only after it has accounted for invested capital in terms of the general purchasing power.

This concept implies that investors have a free choice of spending their money at the time of their investment; and when capital is recovered by operations and retirement of the assets, the investor is again in a position to make a choice of purchasing all things in the economy. This is a single venture concept.⁸ But corporations today, unlike medieval commercial ventures, are viewed as remaining in operations indefinitely.⁹ Corporations continually invest and disinvest in resources in the economy, and as long as they can show profitable operations, a continual supply of funds will be forthcoming from investors. Therefore, corporations are to be viewed as "going-concerns." Thus it is irrelevant to think in terms of a single

⁸Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois: Richard D. Irwin, Inc. 1965), p. 178.

⁹Postulate C-1 of the Maurice Moonitz Study, "The Basic Postulates of Accounting," Accounting Research Study No. 1 (New York: American Institute of Certified Public Accountants, 1961), states, "In the absence of evidence to the contrary, the entity should be viewed as remaining in operation indefinitely." p. 53.

venture concept for a large corporation.

Firms usually deal in specific commodities; therefore, it may be irrelevant to use a general index like the implicit price deflator that tries to maintain the firm's general purchasing power. The index includes the entire range of producers and consumers goods and services. As stated earlier, the foreign sector is also one of the components of the index. A careful scrutinization of the balance sheet of most firms will suggest the inconsistency of the use of this index.

A balance sheet shows the resources of the enterprise and the sources from which they are derived. The original contributions of shareholders and long-term creditors are the main sources. At the point of time of their subscription, the firm has command over general purchasing power; but, because of the objectives of the enterprise, this command is restricted to specific items. Short-term creditors usually contribute specific goods and services or command over such items. The resources of the enterprise (land, buildings, machinery, and equipment) are all specific fixtures. Inventories are of a particular type, and cash is relevant as giving command over resources in which the enterprise has interests. A general index is, therefore, inappropriate to the firm. As Mathews observes, "Such measures are fictional representation of wealth, and have little relevance to the individual firm that has used its purchasing power to buy specific assets."¹⁰

¹⁰R.L. Mathews, "The Price-Level Controversy: A Reply," Journal of Accounting Research, V (Spring, 1967), 114.

It is inappropriate to neglect differential price changes. Individual commodity prices may deviate considerably from the general price level, and have a major impact on some companies. The neglect of such changes produce useless or misleading information from the point of view of business policy and analysis. Adjustments in terms of general purchasing power may be useful for evaluation of the economy as a whole, but are not of much use for specific groups in the economy. It does not represent either the management or the shareholders' viewpoint.

The Consumer Price Index

The Consumer Price Index is also considered as a measure of the general level of prices and agrees closely with the implicit price deflator index. There is a high degree of correlation of the two indices (see Appendix B). For these reasons, it is considered suitable for price level adjustments. Advocates of the consumer price index seem to be primarily concerned with the shareholder's ability to purchase consumer goods. The capital maintenance idea that arises out of this is that "capital is maintained only if the ability of the stockholders to purchase a given quantity and quality of consumers' goods and services is held constant."¹¹

¹¹Eldon S. Hendriksen, "Purchasing Power and Replacement Cost Concepts--Are They Related?" The Accounting Review, XXXVIII (July, 1963), 485.

This view is consistent with the proprietary theory,¹² but the firm is a separate association created by shareholders and accepted by law as an entity in its own right. As such, the objectives of survival and growth are ascribed to it.¹³ The two contrasting concepts of proprietorship and entity lead to the choice of two different types of indices. If one prefers to maintain the purchasing power of shareholders as consumers, then the choice of consumer price index is creditable. However, if one wishes to aid the entity in its day-to-day struggles, then the use of the consumer price index is irrelevant. Moreover corporations today are managed by hired professionals who are interested in not only maintaining, but also increasing the firm's resources. To managers, increasing the shareholders' ability to purchase consumer goods is incidental to increasing the profitability of the enterprise. Therefore, the use of the Consumer Price Index may be inappropriate.

Approaching the problem from the entity framework has some merit for shareholders as well. Accomplishing the objectives of the

¹²The proprietary concept. According to the proprietary concept the owners or shareholders are the centre of interest of the business enterprise. The accounting equation for the proprietorship concept is that assets minus liabilities equal proprietorship. Assets are considered to be owned by shareholders and liabilities are their obligations. Revenues increase shareholders' equity, expenses reduce it. Net income of the enterprise accrues to the shareholders and increases their capital contributions. Interest on debt is considered as an expense. The proprietorship concept emphasizes that increases and decreases in the equity of the enterprise are actually increases or decreases in the wealth of the owners.

¹³David H. Li, "The Nature of Corporate Residual Equity under the Entity Concept," The Accounting Review, XXXV (April, 1960), 259.

entity for survival and growth means accomplishing the profit motive of the shareholders in the long run.¹⁴ However a qualification to this statement may be made, that is, sometimes it is in the best interests of the shareholders to liquidate the enterprise. A corporation will survive and grow as long as it is financially competent and successful. A financially competent firm is not likely to liquidate so as to return its capital to shareholders for consumption--unless, of course, it is formed for some specific purpose. Most large firms reinvest their earnings or additional funds and continue indefinitely. Therefore, the venture idea implicit in a general price level adjustment is inapplicable to today's corporations.

An analysis of the discrete functions of the shareholder may suggest that the consumer price index is not only inappropriate for the firm, but its use may not aid the investor in his decisions. As a person, the shareholder has a dual role: (1) a consumer; and (2) an investor. As a consumer, the shareholder sets aside part of his funds and resources for his personal and family expenditures. As an investor, he entrusts a certain amount of funds to someone else so as to increase his resources in the future. In allocating his resources for investments, the shareholder studies the financial position of the company, its assets, and its promise of future returns. The consumer price index, or any other general purchasing power indices, will not aid him here. Chambers suggests that, since the firm provides the shareholder with gains which are available for consumption, the con-

¹⁴The objective of survival and growth is synonymous with the idea of continuity of the enterprise as stated previously.

sumer price index is relevant.¹⁵ The consumer price index is relevant only to what the shareholder actually receives--that is, dividends. If the firm wants to increase its dividends in accordance with the purchasing power for the consumer, then its use is praiseworthy in that respect. But to apply the index to all items is questionable. A firm does not consume in the sense of consumption by shareholders. It is the centre of investment activity and we are accounting for its investments. It is of economic interest not only to shareholders but also to other groups, so its financial statements are not the proper place to account for the effect of inflation or deflation as it affects shareholders.

In fact, it is not possible to adjust the reported income of the enterprise with the consumer price index. The income of the enterprise does not represent income to the shareholders in proportion to their contributions. It may be so only for dividends declared and for shareholders who purchased the shares at the same time and paid the same dollar amounts. But, it is unlikely that these conditions are met. The operations of the stock-exchange facilitates acquisition and disposal of shares, making it impossible to equate the economic sacrifice of each shareholder. In addition, the burden of maintaining and supervising investments and income taxes is likely to be different for each shareholder. Because of this heterogeneity of the investment

¹⁵Chambers, Accounting, Evaluation and Economic Behaviour (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966), p. 229.

histories¹⁶ of each investor, it is hardly possible to achieve the objectives that the consumer price index enthusiasts may have.

The consumer price index has its limitations even as a measure of the purchasing power of families--particularly of shareholders. It is compiled for urban families with annual incomes ranging from \$2,500 to \$7,000.¹⁷ This is not likely to be representative of all shareholders. In fact, shareholders in Canada come from all income brackets and most of them are likely to be from the higher income levels. Price changes are never uniform throughout the country or among commodities and services, as the average level of retail prices in Canadian cities indicates. Purchasing power is dependent upon specific items purchased by the individual, and no two consumers have identical consumption patterns. Therefore, as an average, the consumer price index has its limitations. "The index, therefore, should not be expected to reflect price changes experienced by other population groups whose incomes, family sizes or places of residence are characteristically different from those of the indexed group!"¹⁸

The weight base of the consumer price index in Canada is based on the 1957 family expenditure patterns. But as the index moves further from the base period, the expenditure pattern becomes inappro-

¹⁶John A. Tracy, "A Dissent to the General Price-Level Adjustment Proposal," The Accounting Review, XL (January, 1965), 173.

¹⁷Before 1959 the range of annual income was \$1,650 to \$4,050. Canada, Dominion Bureau of Statistics, Prices Division, Retail Prices Section, The Consumer Price Index for Canada (1949 = 100) (Ottawa: Queen's Printer and Controller of Stationery, 1961), p. 9.

¹⁸Ibid., p. 8.

priate. New commodities are introduced, and consumer's preference changes for existing commodities as well. As the consumer price index measures only changes in the price of a constant "basket" of commodities, its use for the current time period is limited. Using the consumer price index to measure how "well-off" the shareholders are shows only the "well-offness" in terms of their consumption patterns in 1957. Although this may be better than nothing, it is preferable to use an index that can represent their current consumption pattern.

Geographical and political boundaries are not a hindrance to the mobility of capital. Foreigners may subscribe for shares in Canadian Companies and Canadians on the other hand may have interests in enterprises overseas. Therefore, there is a problem for the "universe" of the consumer price index.

It is also a valid observation that many large companies and institutions are in the investing business; a "market basket" of goods and services has a severe limitation for this category of shareholders. Therefore for the benefit of all shareholders and other financial statement users it is preferable to present the entity's position not in terms of any general consumer purchasing power index, but in terms of the entity's specific purchasing power.

The General Wholesale Price Index

This index is the weighted average of prices of raw, semi-finished goods traded at the wholesale level. It is not an adequate measure of manufacturing commodities. Advocates of the general purchasing power approach have made only passing reference to this index.

This is understandable because it "is not a measure of the purchasing power of money,"¹⁹ though it includes a large number of commodities under eight component material indices. Its component indices will perhaps be useful for analysis of price movements of individual items.

The wholesale price indices were, however, used by the French for the derivation of revaluation co-efficients. The revaluation co-efficients were then used for the calculation of current values. This was the "middle of the road" approach to the problem.²⁰

Rationalizations for General Price Level Adjustments

The reasons why general price level adjustments appeal to accountants are well summarized by Edwards and Bell:

(1) It is normally an important step towards truthfulness in the sense of rendering reality accurately; (2) it does not violate the historic cost principle; (3) it does not violate the realization postulate; (4) it can be objectively applied once agreement has been reached on the price index to be used; and (5) its application for tax purposes would tend to make the income tax more equitable.²¹

¹⁹Canada, Dominion Bureau of Statistics, Labour and Prices Division, Wholesale Price Indexes, 1913 - 1950 (Ottawa: Queen's Printer and Controller of Stationery), p. 4.

²⁰H.P. Holzer and H.M. Schonfeld, "The French Approach to the Post-War Price-Level Problem," The Accounting Review, XXXVIII (April, 1963), 387.

²¹Edwards and Bell, Theory and Measurement of Business Income, p. 23. The realization postulate. This refers to (1) recognition of revenue, and (2) asset valuation, that is, changes in value of assets may result in holding gains and losses. According to the realization postulate under historical accounting thought revenue may be recognized when it meets the following criteria: (a) it is objectively measurable, (b) when a market transaction has occurred between the accounting entity and an outside party, and (c) when the accounting entity has rendered the extent of service which warrants its recognition. Similarly holding gains and losses may be recognized when a market transaction has occurred and objective evidence is available to warrant recognition.

It is doubtful that a general price level restatement of financial data provides relevant and accurate information. This is because of the specific nature of the assets of the enterprise, which the general price level adjustments fail to consider. However, during periods of rapid inflation, general price level adjustments may be preferred to no adjustments at all. At such times, adjustments by the restatement method and current value accounting techniques might produce a minor difference enabling advocates of both schools to agree that any adjustment is better than none.²² When the rate of inflation is moderate, the two types of adjustments can differ significantly. Relative price changes assume importance for the measurement of profit, and restatement by a general price-index might prove useless.

A close adherence to historical costs does not produce any significant data. Constant dollars do not facilitate comparison. (This is illustrated in Appendix C of this chapter.) In addition, the purchasing power adjustments are of little use to aid the firm in maintaining its resources and operating capacity; "price level adjustments by themselves can ensure only that a firm will not unwittingly disperse its real historic cost, which is quite different from its real capital."²³

²²F.K. Wright, "Accounting and Price Changes," in The Accounting Frontier, eds. R.J. Chambers, L. Goldberg, R.L. Mathews (Melbourne: F.W. Cheshire, 1965), p. 60.

²³Edwards and Bell, Theory and Measurement of Business Income, p. 22.

Failure to deviate from the realization postulate and to account in terms of current costs does not permit an analysis of holding gains and losses. Profits of the business enterprise are a summation of two factors: (1) price rises, and (2) increase in value because of operations.

The activities of the business firm in a particular time period resemble an escalator which has the ability to move to one side as well as upwards. Any gains which accrue to the firm as a result of horizontal movements, or holding activities, are capital gains. Any gains made by the firm as a result of vertical movements, or operating activities, are operating profits.²⁴

For a business firm, the opportunity to make profits from the two types of activities must be clearly analysed for a meaningful evaluation and decision as to which activity is important. Accounting Research Study No. 6 considers that unrealized gains do not change the amount of profit, but just the timing of such profit, that is, the accounting period in which the profit may be reported. It also claims that the difference is not affected by the changing dollar.²⁵ It is true that such analysis affects the timing of profits, but the AICPA rationalization is not valid. Holding gains arise when current values increase relative to prices in general.²⁶ An analysis of operating

²⁴Ibid., p. 73.

²⁵Accounting Research Study No. 6, p. 7.

²⁶For example, the current market price of land rises from \$20,000 to \$35,000 at the time when general index rises only from 100 to 125. Therefore, a holding gain of \$10,000 results. The following entries are necessary.

Dr.	Land	\$15,000	
	Cr.	Capital Maintenance	
		Reserve	\$ 5,000
		Holding gain	\$10,000

and holding activities will show management's capability of enhancing the market value of the firm. Holding profits are not purposeful means of enhancing the firm's position. Shareholders and management will know to which time period the gain should be attributed. This aids shareholders in their decision making. "The recognition of holding gains and losses improves the measurement and reporting of current income for predictive purposes ..."²⁷

Income tax will be more equitable if specific price variations are accounted for. Gynther, referring to the British Royal Commission on the Taxation of Profits and Income, mentions that taxing companies on profits derived after adjusting costs with a general index differentiates companies whose costs rise at a steeper rate and vice versa.²⁸

Summary

The implicit price deflators and the consumer price index may be used to adjust for changes in the purchasing power of the dollar. The implicit price deflators reflect the prices of all goods and services in the economy. It measures the effects of inflation or deflation. Because of its all encompassing nature it may be useful to the economist to state the net national product. I do not consider it suitable for adjusting financial statements of a specific business

²⁷American Accounting Association, Committee on Concepts and Standards--Long Lived Assets, "Accounting for Land, Buildings, and Equipment," The Accounting Review, XXXIX (April, 1964), 693 - 94.

²⁸R.S. Gynther, Accounting for Price-Level Changes: Theory and Procedures (Toronto: Pergamon Press, 1966), p. 51.

entity because (1) it represents a community viewpoint, and (2) it does not adjust for specific price changes.

The use of the consumer price index is sometimes suggested, in place of the implicit price deflators, to adjust for variations in the purchasing power of the dollar. This is because of its availability and close approximation to the implicit price deflators. But this index emphasizes the proprietary approach to the problem of price level changes. The firm is of economic interest to several groups and I do not consider that the financial statements of the business enterprise are the proper place to account for the consumption purchasing power of shareholders. The interests of all interested groups may best be served by adopting an entity approach to the problem, rather than accounting for changes in the purchasing power of any particular group. If the shareholders are interested in their consumption purchasing power, they can apply the consumer price index to what they actually receive in the form of dividends or by disposing their shares on the stock exchange. It is inappropriate to apply the consumer price index to the specific resources of the firm as these do not represent the shareholders' economic benefits. I feel that the needs of shareholders and other external financial statement users, in terms of prediction and evaluation of management will be served better if specific price variations are adjusted for the entity.

It is improper to use the consumer price index of the country in which the firm operates because other institutions and foreigners may have interests in the corporation.

The wholesale price index is also inappropriate for adjusting for price level changes because it is not a measure of the purchasing power of the dollar. But, its components may be of some use for an analysis of specific price changes.

The measure of general purchasing power disregards the entity in its struggles towards survival and growth. By adjusting for general purchasing power it enables the enterprise to maintain the historic dollar investments, but fails to allow for the physical maintenance of its capital. It is a narrow approach to the problem of price changes. The close adherence to historic costs accounts for some of the limitations: (1) it fails to account for holding gains and losses; (2) taxes based on general price level adjustments are likely to be discriminatory; (3) it does not enhance the comparability of financial statements. Therefore, to "achieve realism in accounting, we must look beyond the efforts of the price level enthusiasts."²⁹

²⁹ Edwards and Bell, Theory and Measurement of Business Income, p. 23.

APPENDICES TO CHAPTER III

- A. A Continuum of Price Indices
- B. Coefficient of Correlation of Gross National Expenditure
Implicit Price Index and Consumer Price Index
- C. Restatement of an Asset in Terms of General and Specific
Price Indices

APPENDIX A

A CONTINUUM OF PRICE INDICES

A price index can be viewed as specific or general depending on the system of classification and use; for example, the consumer price index is general because it includes a large number of goods and services in all their subdivisions, (that is, food, clothing, transportation, etc.) It is specific because it refers to a particular group of urban consumers. A continuum of price indices will help one to visualize the general and specific index as referred to in this study.

Gross National Expenditure	Consumer Price Index	Wholesale Price Index	Price Index of all Assets of all Industries	Price Index for Assets of an Industry	Price Index for Assets of a Firm	Price Index for an Asset Relevant for One Location and One Use
Implicit Price Deflators	1	1	1	1	1	1

General

Specific

APPENDIX B

COEFFICIENT OF CORRELATION OF GROSS NATIONAL EXPENDITURE
IMPLICIT PRICE INDEX AND CONSUMER PRICE INDEX

Year	N	G.N.E. X	C.P.I. Y	XY	X ²	Y ²
1949	1	100.0	100.0	10,000	10,000	10,000
1950	2	108.1	102.9	11,010	11,680	10,590
1951	3	114.1	113.7	12,970	13,020	12,930
1952	4	119.8	116.5	13,960	14,340	13,570
1953	5	120.3	115.5	13,900	14,470	13,340
1954	6	123.2	116.2	14,320	15,180	13,510
1955	7	123.3	116.4	14,350	15,200	13,550
1956	8	127.9	118.1	15,110	16,450	13,940
1957	9	133.9	121.9	16,320	17,930	14,860
1958	10	136.4	125.1	17,060	18,610	15,650
1959	11	140.2	126.5	17,730	19,660	16,000
1960	12	140.4	128.0	17,970	19,720	16,380
1961	13	141.3	129.2	18,260	19,970	16,690
1962	14	143.4	130.7	18,740	20,570	17,090
1963	15	146.0	133.0	19,420	21,320	17,690
1964	16	149.7	135.4	20,270	22,400	18,330
1965	17	154.0	138.7	21,360	23,720	19,230
1966	18	161.2	143.9	23,190	25,990	20,710
Total		2383.2	2211.7	295,940	320,230	274,060

APPENDIX B - CONTINUED

$$\begin{aligned}
 r &= \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N\Sigma X^2 - (\Sigma X)^2][N\Sigma Y^2 - (\Sigma Y)^2]}} \\
 &= \frac{(18)(295,940) - (2383.2)(2211.7)}{\sqrt{[(18)(320,230) - (2383.2)^2][(18)(274,060) - (2211.7)^2]}} \\
 &= \frac{5,326,920 - 5,270,923}{\sqrt{(5,764,140 - 5,679,642)(4,933,080 - 4,891,616)}} \\
 &= \frac{55,997}{\sqrt{(84,498)(41,464)}} \\
 &= 0.94
 \end{aligned}$$

Note: For a confidence level of 99% and sample size of 18 the coefficient of r must be greater than or equal to (approximately) 0.592. But $0.94 > 0.592$. Therefore over 99% confident.

APPENDIX C

RESTATEMENT OF AN ASSET IN TERMS OF
GENERAL AND SPECIFIC PRICE INDICES

Year	Land Purchases	General Index	Specific Index	Restatement in Terms of 19X9	
				General	Specific
19X0	\$20,000	100	100	\$30,000	\$35,000
19X5	30,000	120	150	37,500	35,000
19X9	-	150	175	-	-
	<hr/>			<hr/>	<hr/>
	\$50,000			\$67,500	\$70,000
	<hr/>			<hr/>	<hr/>

An illustration of a purchase of a similar piece of land at different time periods indicates that general restatements do not show the relative sacrifice involved. Only specific adjustments do.

CHAPTER IV

THE INVESTMENT PURCHASING POWER AND
SPECIFIC PRICE INDEX PROPOSALS

Introduction

External financial statement users, particularly shareholders, wish to appraise management's performance and the firm's financial position. This provides a basis for their decisions concerning the future as they are interested in the prospect of an increase in income. It is my opinion that the use of specific price indices or when available, current market prices, in restating financial position and the results of operations should provide a sound basis for their decisions.

However, the advocates of the use of specific price indices for adjusting structural price changes (the relative change in the prices of goods and services) are not in agreement as to how specific an index should be. Professor Hendriksen¹ after discussing three concepts of investment purchasing power for (1) the firm, (2) the industry and (3) the economy, recommends the use of the economy investment purchasing power index for corporations in the United States. Others advocate the use of a specific index for each asset²

¹Eldon S. Hendriksen, "Purchasing Power and Replacement Cost Concepts--Are They Related?" The Accounting Review, XXXVIII (July, 1963), 483 - 91.

²Reg. S. Gynther, Accounting for Price Changes--Theory and Practice (paper presented at the 28th Annual Research Lecture Meeting of the Australian Society of Accountants, Victorian Division, Melbourne, October 26, 1967), p. 9.

current costs³ and replacement values⁴ as adopted in the Netherlands. There are also suggestions for the use of current cash equivalents⁵ and current market buying prices.⁶ Each of these suggestions has conceptual and practical implications. These will be considered in this chapter with a view to their relevance for external financial statement users--particularly for investors.

Investment Purchasing Power

Conceptually, investment purchasing power is based on the firm's ability to maintain its purchasing power to acquire investment goods. Profits accrue to the firm after it has maintained its investment purchasing power. This concept allows for the continuity of the enterprise to a certain extent. Usually for a venture, the operating cycle is said to be from cash to non-monetary assets and back to cash. But for an enterprise that remains in business, the operating cycle could be from non-monetary assets to cash, back to non-monetary assets. Thus the firm keeps replacing its assets. An enterprise that is maintaining its investment purchasing power is

³Willard J. Graham, "The Effects of Changing Price Levels Upon the Determination, Reporting and Interpretation of Income," The Accounting Review, XXIV (January, 1949), 15 - 26.

⁴A. Goudekot, "An Application of Replacement Value Theory," The Journal of Accountancy, CX (July, 1960), 37 - 47.

⁵R.J. Chambers, Accounting, Evaluation and Economic Behavior (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966), p. 92.

⁶F.K. Wright, "Capacity for Adaptation and the Asset Measurement Problem," Abacus, III (August, 1967), 74 - 79.

therefore attempting to maintain continuity of life.

There are three levels of investment purchasing power and the relevance of each is dependent on the behavioral patterns of business enterprises in an economy.

(1) General Investment Purchasing Power. The implicit assumption is that of perfect mobility of capital within an economy. Therefore the firm must be able to invest in an equal quantity of investment goods, making allowance for diversification. A general investment purchasing power index is required to adjust for price level changes.

Another assumption of this concept is that management, with a perfect knowledge of investment markets, avails itself of opportunities when they arise. If management takes advantage of the opportunities then investment diversification is likely to take place in the relatively short run. These assumptions may not be valid. But, Hendriksen maintains that because of a number of examples and possible diversification by other firms from one industry to another an overall investment index for the economy is most relevant for adjusting for price changes.⁷

Such a comprehensive index is not available for the United States (or for Canada) and he has suggested an approximate solution,⁸ by combining the segments of implicit price deflators--"other new construction," and "producer's durable equipment." It is unlikely that such an index is relevant for all firms. While some firms may

⁷Eldon S. Hendriksen, Accounting Theory (Homewood, Illinois: Richard D. Irwin, Inc., 1965), p. 180.

⁸Ibid.

diversify and extend their interests horizontally, others may be concerned with vertical integration. In addition, the use of an economy wide investment index may be inappropriate to some firms, the economic interests of which are restricted to certain geographic regions, while others transcend international boundaries. Considering an investor viewpoint the use of an economy wide investment index is irrelevant to the specific resources of the firm in which investor is interested.

(2) Industry Investment Purchasing Power. The industry investment purchasing power index is based on the assumption that the firm instead of investing in all goods in our economy, identifies itself with a particular industry. Therefore, an adjustment for movement of prices in commodities in which the firm might invest requires the use of an index for each industry.

The problem presented by this concept is the arbitrariness of the definition of an industry. Though some firms may be clearly defined to an industry, the close relationship on the demand side of the firm's output with other firms, or the relationship of the firm's factors of production with other firms make it difficult to delimit the boundaries of an industry. For example, a steel mill and an aluminium plant may be independent in their sales market, but when located in the same area they will probably be rivals in the labour market. Similarly, there may be some degree of substitutability on the demand side. Therefore, it is difficult to set a definite boundary for an industry. Economists sometimes

explain the concept of an industry by the analogy of a chain. Substitutes are considered as linked together to form a chain and an industry is delimited by gaps in the chain. A firm may be defined to an industry because of the complementary nature of its output with other firms. But complementary products would then be regarded as on a different level in a vertical industry. Spatial considerations may also be used to define an industry. For example a retailer in Alberta may be considered to be in a different industry from a retailer in Ontario because they are not competing with each other in one geographical area or market. But, when there is some legislation which affects all retailers in Canada, then they are considered to be in the same industry. Thus, some firms may be arbitrarily assigned to an industry,

(3) Firm's Investment Purchasing Power. The firm's investment purchasing power is based on the assumption that past investment behavior of the firm will be relevant to the future. Therefore, the firm should maintain its investment purchasing power, in terms of its assets as a whole. This implies the use of a firm's investment index (properly weighted by the amounts spent on different assets). Such an index provides a good approximation of the firm's purchasing power.

Past investment behavior of the firm may not be a good indicator of the firm's future policies, but it is a reasonable starting point for analysis. The concept considers the firm as a focal point and is concerned with its survival. Of the three investment purchasing power concepts, this is probably the most relevant from the entity point of view. But, Professor Hendriksen considers

this the least relevant of his three suggestions.⁹ In fact, considering the needs of external financial statement users, one could use specific price indices, instead of the firm's investment index. Why obtain an approximate solution by using a weighted average price index of the firm's resources when specific price indices can be easily applied? This is considered in the following section together with "Current Costs and Replacement Values."

Current Costs and Replacement Values

The terms current costs and replacement values are not interchangeable. In fact, each term is assigned a different meaning by different people. Current costs could refer to: (1) original invested costs adjusted with a specific cost index of each asset; (2) current costs as reflected by current market buying prices; and (3) the current realizable price of an asset--current cash equivalents.

Replacement costs too could refer to one of several ideas:

(1) current cost of replacing an asset or building in the same location; (2) current cost of replacing an asset of similar or equivalent service; and (3) eventual replacement costs.

Current Costs

(1) Original invested costs adjusted in terms of specific indices are just approximations of current costs. For example,

⁹E.S. Hendriksen, Accounting Theory, p. 180.

an asset might have been purchased for \$12,000 when the price index for the asset stood at 100. It is now available for \$15,000, and the specific price index of the asset has increased to 130. Thus, a restatement of the asset in terms of current costs is \$15,600. The reason for such a difference should be obvious. Original invested costs are determined by market conditions at the time of acquisitions, thus reflecting efficiencies or inefficiencies of purchase. There is bound to be some degree of error in the compilation of the price index itself. This may be due to the method of collecting the price data, or the use of an averaging technique in obtaining the price of the asset. The asset may be priced differently at different geographical areas within national boundaries. With the increase in price level the current cost revaluation will reflect the insufficiency of provision for depreciation, necessitating a provision for an additional amount.

(2) Perhaps, because of the difficulty of obtaining specific price indices for individual assets, or because current costs are actually a means of revaluation, some writers suggest the use of current market buying prices. Current market buying prices could reflect the current cost of securing the same service, but do not show the cost of eventual replacement. However, it is only possible to obtain current market buying prices of assets that are still available in "shop windows." Therefore, one still has to rely on specific indices for items not available in the market.

The support for the use of current market buying prices rests

on the idea of opportunity cost, which is defined by Wright as the cost to an entity, if it did not own the asset.

When a firm, in the course of business, experiences the need for a certain asset, which it does not already own, it will have to acquire that asset, and it will naturally do so on the most favourable terms currently available. Conversely, if the firm does already own the relevant asset, this fact of ownership enables it to avoid the additional cost which it would otherwise need to incur. The cost so avoided may therefore be described as the opportunity cost.¹⁰

It may be said that this definition of opportunity cost is different from that of the economist. The economist considers opportunity cost as the cost of an alternative that is foregone, as a result of obtaining something different. For example the cost to an individual who owns his home is the loss of income that he could have earned by investing that money.

Chambers considers opportunity cost to be the market resale price or the current cash equivalent of an asset. He considers that for purposes of adaptations to contemporary conditions, only selling prices can indicate capacity. But selling prices may have little relevance for inventory and fixed asset revaluation. The use of sale price for fixed asset suggests either scrapping of an asset or the liquidation of the enterprise, which may not be contemplated or imminent. For inventories, sale price may differ widely from buying price to the firm because these are representative of different markets. It may be preferable to restate inventories in terms of the buying price. Chambers recognizes the weakness of the use of

¹⁰Wright, "Capacity for Adaptation and the Asset Measurement Problem," p. 75.

sale price from another angle. Though he would prefer to use the current cash equivalents of individual assets to restate the financial positions of the enterprise, he accepts a modification to his model--the use of "specific indexes in lieu of actual prices only because of thinness of the market."¹¹

Therefore, only an existence of a good market of assets will enable one to use current market buying prices or current cash equivalents for revaluation of assets.

Replacement Costs

The idea of the current cost of replacing an identical asset is related to the use of specific indices and current market buying prices. However, replacement costs of assets of equivalent capacity do not have similar implications. The asset need not be technically identical, but may be economically efficient. For example, two piston-engine planes might be replaced by one new model jet.

Replacement costs here do not mean actual replacements but just that capital can be exchanged for an identical collection of goods or it allows for the maintenance of equivalent operating capacity.

The concept of replacement cost as used in some European countries encompasses not only the above mentioned ideas, but also

¹¹Chambers, Accounting, Evaluation and Economic Behavior, p. 249.

eventual replacement.¹² If an entity has signed a contractual agreement for the acquisition of a new asset in the future, then it is the contract price that is the basis for the amount of charges against revenue. This is applicable not only to raw materials and fixed assets but also to wages and other elements of costs. Replacement value accounting eventually provides an exact amount for replacement of an asset. Profits will therefore be a residual amount after investments in physical assets have been maintained.

The "eventual replacement" concept has limitations and imposes some practical difficulties. The concept can be used for accounting purposes, irrespective of whether prices are stable or unstable. It actually does not adjust original invested costs for structural or price level changes, but includes costs relevant to the future. In fact, the concept of replacement cost itself may be inappropriate, because replacement may not be in contemplation. Moreover, the idea of restating financial statements is to account for cost of assets in use and not for assets which are potential candidates for use.

To summarize, current cost information may be furnished by specific current market prices of similar assets. Where similar assets are not available, assets of equivalent service potential may be useful indicators of current costs. Of course, specific indices for particular groups of assets can always be used. For instance,

¹²For a discussion of Replacement Values as practised in the Netherlands see: L.S. Rosen's "Replacement-value Accounting," The Accounting Review, XLVII (January, 1967), 106 - 113.

restatement of the cost of a factory building can be on the basis of index numbers for the cost of that type of building.

The American Accounting Association's Committee on Concepts and Standards--Long Lived Assets recommends:

Where there is an established market for assets of like kind and condition, quoted prices provide the most objective evidence of current costs. Such prices may be readily available for land, buildings, and certain types of standard equipment. Where there is no established market for assets of like kind and condition, current costs may be estimated by reference to the purchase price of assets which provide equivalent service. The purchase price of such substitute assets should be adjusted for differences in operating characteristics such as, cost, capacity, and quality. In other cases, adjustments of historical cost by the use of specific price indexes may provide acceptable approximations of current cost. Appraisals are acceptable only if they are based on the above methods of estimating current cost.¹³

The recommendation rules out the idea of eventual-replacement and is restricted to the maintenance of service potential of the assets of the enterprise. I agree with the above recommendations of the AAA. Current market buying prices, estimates of current costs of equivalent service, or the use of specific price indices should provide external financial statement users with the relevant economic information for their decisions. The use of current costs--current market buying prices, current cost of assets of equivalent service, or to some extent original invested cost adjusted with specific price indices--allows for the maintenance of the firm's operating capacity and should be a good indicator of the firm's ability to provide future income.

¹³ American Accounting Association's Committee on Concepts and Standards--Long Lived Assets, "Accounting for Land, Buildings, and Equipment," The Accounting Review, XXXIX (July, 1964), 694.

Some Implications of the Use of Specific Indices

The use of specific indices imposes practical difficulties. Specific index numbers may be unavailable. Generally there is a paucity of such information, though some specific price indices are available for Canada. Therefore, specific price indices may have to be computed for the firm. Another problem is the application of specific index numbers to monetary items.

Monetary Gains and Losses

For a computation of gains and losses on monetary items,¹⁴ the choice of specific indices will depend upon circumstances in each case. Particularly, the choice depends upon the reason for which the monetary item is held. If the monetary item is held for the purchase of land, and the price of land rises, then the index for land is relevant for the calculation of a monetary loss. However, it may not be so simple. Many items are handled by the individual firm and a representative index may have to be used. This is probably the main reason why some writers recommend the use of a general index for monetary items. Perhaps an investment index for the firm will serve the purpose well. This may not be maintaining the firm's capital, but seems appropriate when there could be so many difficulties involved in trying to determine the specific reasons why cash

¹⁴Monetary items. Monetary items refer to cash and various forms of contractual claims and obligations which refer to specific amounts of money. Monetary assets may be listed as cash, accounts and notes receivable, monetary investments in the form of securities both short and long term. Monetary current liabilities require payment of fixed amount of money.

is being held. Therefore, the use of the firm's investment price index is suggested for reasons of practicality.

Holding Gains and Losses

Sometimes it is also said that current costs do not permit an analysis of holding gains and losses. The use of both the general and the specific indices will permit such an analysis. Sprouse and Moonitz maintain that:

changes in resources should be classified among the amounts attributable to:

- (1) Changes in the dollar (price-level changes) which lead to restatement of capital but not revenue or expenses.
- (2) Changes in replacement costs (above or below the effect of price-level changes) which lead to elements of gain or of loss.¹⁵

But the use of specific current costs do permit an analysis of capital gains and specific current cost profit. For example:

Sale price of an asset	\$750
Historical cost	500
General price-level adjusted cost	540
Specific price-level adjusted cost	600
Historical cost profit	<u>250</u>

which is the sum of

(1) operating profit	\$150
(2) holding gain	\$100

The amount available for distribution is the operating profit. The difference between the current input price and the historical cost is the holding gain. It is inclusive of the price level gain which is the difference between the general price level adjusted cost and the

¹⁵Sprouse and Moonitz, Accounting Research Study No. 3, p. 55.

historical cost, that is, \$540 - \$500. Those who hold a general purchasing power concept, or a shareholder purchasing power concept, or even the investment purchasing power concept of the firm can revalue assets in terms of specific price indices and "treat any difference in movement between the two as holding gains or losses."¹⁶

The one hundred dollars of capital gain is not distributable, as it is required to maintain the same level of business, because the firm has to consider the higher cost price when the item is replaced after sale, and the current cost of sale is the higher price.

Income

In the computation of income, historical cost accounting (as stated previously) leads to the matching of dollars of different purchasing power. Income is earned as long as revenues are in excess of the financial dollars invested in assets and related expenses. But, the use of current cost means income is earned only when the physical assets, or the productive capacity of these assets (or at least the current value of historical cost dollars) is maintained. Goudekot observes, "Profit is ... the income which may be spent without trespassing on the capital of the business, which is the source of income. The fruit may be picked, but the tree may not be felled."¹⁷ Therefore, profits are a residual after allowance for the

¹⁶R.S. Gynther, Accounting for Price-Level Changes: Theory and Practice, p. 12.

¹⁷A. Goudekot, "How Inflation is Being Recognized in Financial Statements in the Netherlands," The Journal of Accountancy, XCIV (October, 1953), 448 - 449.

maintenance of resources, and resources are looked upon as economic quanta of an entity which are not to be disbursed.

Realization

Accountants, adopting a strict criteria of realization; (measurability, objectivity and the existence of a market transaction) do not recognize profits during production or due to an increase in the price or value of an asset over time. Even if the market value is established by enumerable transactions among outsiders or a sufficiently objective and verifiable index is available, accountants still fail to recognize the increase in the value of an asset. But, an acceptance of the use of market prices or specific indices for revaluation purposes means a broad view of realization will have to be adopted. An index may be established by a few transactions, but it is still sufficiently objective. Adopting the use of a specific index for recognizing a change in the asset means that income is not the difference between sales price and current cost, as illustrated earlier. This will exclude both the general price level and the specific price changes, which will be a revaluation reserve unavailable for distribution.

Summary

In discussing proposals for specific price level adjustments, investment purchasing power concepts, current costs and replacement values may be considered. There are three levels of investment purchasing power. These are for: (1) the economy, (2) the industry,

and (3) the firm. A general investment price index may be used to adjust for investment purchasing power of the economy. Such a comprehensive investment index is not available for Canada. An approximate solution is to use the segments of implicit price deflators-- "new construction" and "producers durable equipment." The general investment price index of the economy is not applicable in adjusting for price variations of specific resources of the firm. For some firms economic interests may be restricted to certain geographic regions of the particular economy, while other firms may have investments in several countries. The use of industry investment purchasing power index is impracticable because of the difficulty in defining an industry. The firm's investment price index is most relevant, for this aids in the maintenance of the firm's investment purchasing power. However, the use of specific price indices will provide greater accuracy (though specific indices are still averages).

The use of specific price indices in adjusting for price variations of specific assets aids in maintaining the firm's operating capacity. However such adjustments do not provide for actual amounts required for replacements because original costs which are adjusted with specific price indices still refer to market conditions of the past. The use of specific price indices imposes some difficulties when adjusting monetary items. Practicality may suggest the use of an investment index of the firm. An analysis of holding gains and losses is possible by adjusting for specific price variations. The realization postulate and the matching of revenues and expenses

are affected by utilizing specific price indices. The existence of a price change in the market is sufficient evidence for recognizing the changes in assets and liabilities in accounts.

There are also suggestions to use current market buying or realizable prices to adjust for specific price variations. But when these are not available one has to rely on specific price indices. Current cash equivalents or market realizable prices are not recommended for adjusting financial statements, because these suggest liquidation.

In accounting for changes in prices of specific assets, one can think not only of adjusting for assets in use, but also in terms of current cost of identical assets or assets of equivalent capacity. This relates specific price indices to replacement costs. When referring to replacement costs eventual replacement may come to mind, but this is usually considered as beyond the scope of adjustments for price variations. It does not relate to assets in use.

It is recommended that specific price indices be relied upon when adjusting for price changes. But specific price indices are averages and provide approximations of current costs only. Therefore it is preferable to use market buying prices when these are available, or to rely on the current cost of an asset of equivalent service when it can be easily estimated. Adjustments by such procedures will provide external financial statement users with a correct current financial position of the enterprise. This will aid them, particularly

the shareholders, in evaluating management. It will also provide them a sound basis for prediction of economic benefits, in so far as the financial position and the results of current operations are the basis for such predictions.

CHAPTER V

CURRENTLY AVAILABLE PRICE INDICES FOR CANADA

Introduction

The use of price indices for restating financial data was considered in the previous chapters of this study. For general price level adjustments, the use of Gross National Expenditure Implicit Price Deflator Index, or the Consumer Price Index, is often recommended. For revaluing individual assets, several specific price indices are suggested. It is the writer's considered opinion that specific price level adjustments will aid external financial statement users and the use of general price indices, the Consumer Price Index, the Wholesale Price Index or the Implicit Price Deflators is not recommended. However, an analysis of these indices is included in this chapter for the benefit of those who favour general price level adjustments.

In discussing price indices several fundamental issues may be raised: (1) their availability; (2) their characteristics; and (3) their relevance for accounting purposes. Therefore, in this chapter, in addition to stating the price indices available for Canada, some of their characteristics, the formulae used, time and weight bases, and their major components are stated. Also, some comments are made about their appropriateness for financial statement readjustments. However, before proceeding to discuss these, a brief introduction to index numbers may be appropriate.

Price indices are a device for comparing the magnitudes of a price change of a group of commodities for a specific time period. Usually, a definite time period is chosen as a base, from which the magnitudes of changes are stated. Price indices do not include units of quantity but refer only to price changes. Units of quantity, indirectly, influence the computation of a price index. The value of a commodity, as a product of its price and quantity, is used to assign weights for computation of a price index. This takes into account the significance that may be attached to each commodity.

An index could be current or base weighted. Base weighted indices are given by the Laspeyres' formula:

$$P = \frac{\sum p_n q_o}{\sum p_o q_o}$$

The current weighted index is given by the Paasche's formula:

$$P = \frac{\sum p_n q_n}{\sum p_o q_n}$$

Where P means the price index; p, the price of a commodity; and q, the quantity. The subscripts "o" and "n" refer to the base and current periods, respectively.

The base weighted formula expresses the price change to a fixed amount of specified commodities, while the current weighted index expresses the price change of given commodities, with changing quantities of consumption or purchases.

In addition to these two common price indices we may refer to the fixed weighted index, which is identical to the base weighted index, except that the weights assigned are not from the base period,

but from a different period. An example of this is the Consumer Price Index for Canada, for which the base date is 1949, but the weights are assigned according to the 1957 expenditure pattern of sample families.

Price indices are averages; these could be arithmetic, harmonic or geometric. Generally, arithmetic averages are used for price indices, but Fisher's ideal index is based on a geometric average of both the Laspeyres' and Paasche type of indices.¹

The Laspeyres' and the Paasche's price indices are said to set the upper and lower limits of price change. Since less of a commodity is bought as a result of an increase in price (other things remaining the same), the use of base year quantities assigns too much weight to items whose price has increased the most. Thus the numerator of the Laspeyres' index will be too large and cause an upward bias. On the other hand the Paasche's index has a downward bias. The value of the Fisher's index ties in between these two. Most of the price indices for Canada are, however, based on the Laspeyres' formula.

Available Price Indices

Gross National Expenditure Implicit Price Deflator Index

The Implicit Price Deflator Index is the outcome of the deflation process for the Gross National Expenditure Volume Series. The Gross National Expenditure is sub-divided into its four sectorial

¹For the formula and a note on other price indices see, Frederick E. Croxton and Dudley J. Cowden, Applied General Statistics 2nd ed.; (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1955), pp. 409 - 411.

accounts: (1) consumer expenditure on goods and services; (2) government expenditure, which includes current expenditure and gross fixed capital formation; (3) business gross fixed capital formation, which is made up of new residential and non-residential construction, and new machinery and equipment; and (4) net exports of goods and services.

Each of the main components, of the sector accounts of the Gross National Expenditure, is divided by a specially constructed price index, to arrive at constant dollar estimates. In fact, the whole deflation process is carried on in a fine detail:

The first step in the deflation procedure is to obtain a breakdown of the value series in as fine an item detail as possibleThe second step is to deflate each item with a price index that has been selected or constructed so that its commodity content and weighting pattern will correspond with that of the value data. Each item so deflated is then expressed in constant dollars. The third step is to sum the detailed items in constant dollars to derive the main aggregates, personal expenditure, government expenditure, and so on. Gross National Expenditure in constant dollar terms is arrived at by this summation process. If the current dollar series are then divided by the constant dollar series at this aggregative level, this process will yield a set of implicit price indexes which are currently weighted.²

As the implicit price indices are currently weighted, they reflect: (1) price changes; and (2) changing expenditure patterns within and between major components. This does not permit a comparison between one year and another, except with the base period.

Implicit price indices, however, are to a certain extent influenced by base weighted indices, as many of the sub-indices

²Canada, Dominion Bureau of Statistics, Research and Development Division, National Accounts Income and Expenditure 1926 - 1956 (Ottawa: Queen's Printer and Controller of Stationery, 1962), p. 177.

employed in the deflation process are base weighted.

Currently, the indices are available from 1926 for Canada. Price indices based on 1935-39 were used to deflate the Gross National Expenditure from 1926-47, while indices based on 1949 were used to deflate subsequent periods. Nineteen hundred and forty-seven was the year of overlap for the linking process. At present, 1957 base weighted indices are employed, but the Implicit Price Indices deflated with the 1949 base weighted indices are still available.

The implicit price index is the only index that encompasses the whole economy; it is an average of the prices prevailing for all goods and services exchanged. Since it is a reflection of the level of prices generally, the purchasing power of money could be considered as a reciprocal of the index. It is, therefore, a broad general index and is considered as "reliable enough for accounting purposes."³ However, the theoretical objection for its use is that it is currently weighted, and "there is some doubt whether an index number constructed in this manner should be treated as a continuous economic series and used mathematically as other index numbers are."⁴

The Consumer Price Index

The Consumer Price Index for Canada replaces the Cost-of-Living

³Accounting Research Study No. 6, p. 112. This refers to the United States. However, it is equally applicable to Canada because the computation of implicit price deflators is based on the Paasche formula for both countries and measures the price changes of all goods and services for the two countries respectively for a given year.

⁴Jones, Effects of Price Level Changes, p. 179.

Index, which dates back to 1900. Currently, it is the fourth in a revision of a series. The earlier four series had the years 1900, 1913, 1926, and 1935-39 as the time and weight bases. The current 1949 time base index has been revised to include the 1957 weight base. The Cost-of-Living Indices prior to 1949 have been linked to the 1949 time base, and the monthly and annual indices are available from 1914.⁵

The main components of the present Consumer Price Index are: food; housing; clothing; transportation; health, and personal care; recreation and reading; and tobacco and alcohol. Some three hundred items are included. There is, also, a supplementary classification of the index--between commodities and services. In addition, consumer price indices for regional cities are available.

The index is a wide representation of urban families, and refers specifically to families in 27 Canadian cities with over 30,000 population. Family size, of the sample families, ranges from two adults to two adults and four children. Annual income ranges from \$2,500 to \$7,000. The target group is representative of urban industry and occupation, and includes people whose principal source of income is wages and salaries.

The Consumer Price Index can be said to measure the percentage change in retail prices for a constant "basket" of goods and services purchased by a specific group of urban families. It cannot be said

⁵Canada, Dominion Bureau of Statistics, Labour and Prices Division, Prices Section, Prices and Price Indexes: Wholesale-Farm-Consumer-Security, 1949-1952 (Ottawa: Queen's Printer and Controller of Stationery, 1954), p. 110 - 11.

to reflect price changes experienced by other family groups who do not conform to the characteristics of the representative group.

The formula used for the computation of Consumer Price Index is the Laspeyres' type. It is, therefore, a fixed base index. Since 1949 is the time base and 1957 is the weight base for the index, a linkage of one to the other is involved. The 1949 base index is used to measure price changes to January, 1961; subsequently, the 1957 base index is used from January 1961 to the present. January 1961 is, therefore, the linkage date at which time both indices are identical for all components.

For accounting purposes, the Consumer Price Index is considered as a measure of the purchasing power of the dollar, particularly, as related to consumption goods. Jones recommended its use in the United States for financial statement adjustments because:

(1) It is a widely used and generally accepted index of changes in the general price level, and, as a reciprocal in the value of the dollar.

(2) It agrees rather closely with the implicit index developed by the computation of gross national product in uniform prices.

(3) It is less affected by technological changes than are some of the more specialized index numbers.

(4) It fluctuates less than any other currently available general index and therefore produces smaller and less erratic adjustments for price level changes.⁶

It is true that the Consumer Price Index agrees closely to the Gross National Expenditure Implicit Deflator Index but to say that it is a reciprocal of the value of the dollar is to imply that approximately 300 commodities, consumed by a specified group of urban

⁶Jones, Case Studies of Four Companies, p. 3.

families, are an adequate representation of measuring the changes in the value of the dollar. The Consumer Price Index may cover a wide area of common experience, but it is restricted to consumption goods and reflects the price changes experienced by the "target group" only.

It is possible that the Consumer Price Index is less affected by technological changes. Pricing of items is strictly according to specification, so that it is possible to distinguish between price and quality changes. Specification of items is based on a large proportion of sales of a commodity, so as to exclude a wide range of quality. However, it is not the ideal solution, and the problem of quality changes still persists, because:

(1) Published price averages exclude qualities which fall outside the range of specifications and which will usually sell for higher or lower prices ...

(2) The specifications encompass a range of qualities, which varies from item to item, and a corresponding range of prices.⁷

The Consumer Price Index measures the relative price changes of a "basket" of commodities, which were determined by the consumption pattern of urban families in 1957. This allows for a comparison of year to year price changes. But, this "basket" may no longer be representative today, as changes are bound to have occurred in the consumption pattern. This problem is, however, not restricted to the Consumer Price Index alone, but is usual with all general indices of fixed-weights.

⁷Canada, Dominion Bureau of Statistics, Labour and Prices Division, Prices Section, Prices and Price Indexes: October, 1957 (Ottawa: Queen's Printer and Controller of Stationery, 1957), p. 4.

General Wholesale Price Index

The General Wholesale Price Index was first published by the Department of Labour in 1910, on the 1890-1899 base. The Dominion Bureau of Statistics first published these in 1923 (on the base of 1913 = 100) and later reweighted and transferred to a 1926 base, but the general reference period is now 1935-39. Using this base, the Dominion Bureau of Statistics has computed annual Wholesale Price Indices from 1867, and monthly from 1891.⁸

The General Wholesale Index incorporates a diverse selection of both primary and processed commodities, but is an inadequate measure of manufactured commodities. It includes eight major group indices: (1) vegetable products; (2) animal products; (3) textile products; (4) wood products; (5) iron products; (6) non-ferrous metal products; (7) non-metallic mineral products; and (8) chemical products.

This index is also based on the Laspeyres' formula and has a rather remote base date, 1935-39. Its limitations are listed as:

...the index cannot be associated with any adequately definable value aggregate. Unlike a Consumer price index which can be identified with expenditures of household consumers, a general wholesale index covers a host of overlapping transactions sometimes involving the same ingredient in as many as three different stages of processing. Yet, conceptually, it is not a measure of the purchasing power of money because it omits significant areas of monetary transactions such as prices of land, labour, securities and services, except in so far as price of these things are implicit in commodity prices.⁹

⁸Canada, Dominion Bureau of Statistics, Prices and Price Indexes: Wholesale-Farm-Consumer-Security, pp. 14 - 16.

⁹Canada, Dominion Bureau of Statistics, Prices Division, Prices and Price Indexes April 1968 (Ottawa: Queen's Printer and Controller of Stationery, 1968), p. 40.

For accounting purposes, the General Wholesale Price Index may not be useful, except that "the group indexes and individual price series that are components of all commodity index would be of most value in making adjustments to financial reports for changes in specific prices."¹⁰

Canadian Farm Products Price Index (1935-39 - 100)

This index measures the change in wholesale prices of farm produce, grains, livestock etc., at terminal markets. It includes the cost of freight, storage, handling charges and processing where necessary. It is unlikely to be of use for accounting purposes.

In addition to the farm produce index, there are Price Indices of Commodities and Services Used by Farmers. These include price indices of farm machinery, equipment and materials, taxes and interest rates, and farm wage rates. These may be of use for indicating the replacement cost of farm machinery and equipment.

Industry Selling Price Indices

The Industry Selling Price Indices are another series of wholesale indices, covering 102 industries in 16 major industry groups. These include most of the Canadian industries and are the first indices prepared according to the Standard Industrial Classification. Referring exclusively to manufacturing industries, these are available only from 1956.

¹⁰Accounting Research Study No. 6, p. 105.

Together with the individual price series of the General Wholesale Index, these are the most comprehensive indices available and may prove useful for an analysis of specific items.

Quality changes can prove to be significant with manufactured items. Therefore, certain techniques are adopted to solve this problem. Quality is defined in terms of the physical characteristics of the item, and a comparison of deflated dollar values of inputs is the chief method of evaluating this change.¹¹ This is considered only after differences due to changes in technology are eliminated.

The Building Materials Indices

The Residential and the Non-Residential Building Material Indices are wholesale price indices related to the construction industry. They replace the General Building Material Index which was available from as far back as 1890.

(1) The Residential Building Material Index. This is calculated on the 1935-39 time base, and the weights were derived from the estimated material requirements of the housing target for the country in 1946. This may, therefore, prove to be out of date; but, in 1966, commodities included in the index were "revised following consultation with industry specialists, to produce a shorter but more efficient sample of commonly-used commodities."¹²

¹¹For an example of techniques used for evaluating quality change see, Canada, Dominion Bureau of Statistics, Prices Division, Wholesale Prices Section, Price Indexes of Electric Utility Construction, 1956-65 (Ottawa: Queen's Printer and Controller of Stationery, 1967), pp. 29 - 30.

¹²Dominion Bureau of Statistics, Prices and Price Indexes April 1968, p. 41.

There are about 90 price series included in the residential index, and these are classified into the major component groups of: concrete products, brick, lumber and lumber products, wall board and insulation, roofing materials, paint and glass, plumbing and heating equipment, electrical equipment and fixtures, and metal products. Prices of some of the component groups are taken from the Industry Selling Price Indices.

The index is the weighted materials requirement of residential building costs; and, on the average, it is estimated that building materials comprise about 52.5 per cent of residential building costs. Another 37.5 per cent is attributed to labour. This is exclusive of builder's commission and real estate costs.

(2) The Non-Residential Building Materials Price Index.

This is similar to the residential series index, but is related to prices entering non-residential building construction. The material costs of engineering construction, such as bridges, power dams, roads and railroads, highways, docks etc., are excluded from this index. It is, however, based on nine use-types of building structures and includes twelve major material groupings. The nine use-types can be listed as: churches, factories, garages, hospitals, office buildings, schools, stores, warehouses and others.

This was first published in 1949. The same year was used as the time base, and the weighting pattern is according to the 1949 estimated value of construction of each use-type. The index is available back to 1926.

Since material costs of nine use-types of buildings are included in the non-residential index, one may consider it as a general index which may be inapplicable to any one use-type. This is not a serious defect, however.

Price indexes calculated for each of the use-type groups for December 1952 were close to the total non-residential index. Seven of the use-type group indexes were within 0.6 per cent of the Non-Residential composite, one was 1.4 per cent higher, and one was 1.0 per cent lower. The closeness of the price indexes produced for the nine use-type groups to the total index, suggests that the Non-Residential Building Materials Price Index is, with certain qualifications, suitable for use in estimating replacement costs for a variety of buildings.¹³

The qualifications stated are that: (1) regional prices differ, but the index is for Canada as a whole; (2) because of a variety of methods of construction and the use of materials, individual building costs and price indices can differ significantly from those of the total non-residential buildings.

For an estimation of replacement costs of residential and non-residential buildings, material price indices have to be combined with the construction labour wage rate indices to produce a composite index. For residential buildings, material costs are 52.5 per cent and labour costs 37.5 per cent of the total cost. For non-residential building construction, the ratio between on-site labour cost and materials is 35:65. This is simply an approximation.

¹³Canada, Dominion Bureau of Statistics, Labour and Prices Division, Price Section, Non-Residential Building Materials Price Index 1935-1952 (Ottawa: Queen's Printer and Controller of Stationery, 1953), p. 11.

For eight of the use-type groupings (churches were not examined for this attribute) the ratio ranged from approximately 30:70 to 39:61. Accordingly it must be remembered that the 35:65 ratio is not the most suitable for every use. It is of course, the most appropriate in constructing an index related to the total value of non-residential construction.¹⁴

Index Number of Average Wage Rates

Index Number of Average Wage Rates are based on an annual survey, conducted normally in October, by the Economic and Research Branch of the Department of Labour. Results of the survey are usually published between February and June, in the following year. The survey covers about 30,000 establishments, with 15 or more employees, in 87 industries and 52 communities throughout Canada.

Essentially, two groups of tables of index numbers of wage rates are presented: (1) for industry; and (2) for communities. The industry tables show, by occupation, average wage rates for the industry as a whole, and averages and predominant ranges for provinces. In fact, industries are classified into eight main industrial groups: logging; mining; manufacturing; construction; transportation; storage and communication; electric light; heat and power trade; and personal service. Average wage rates for each industrial group are available.

The 52 community tables show occupational rates--averages and predominant ranges--for all industries surveyed in the community, and separate averages for major industries. The indices of wage rates

¹⁴Ibid., p. 11.

were first published in 1921; however, statistics of earlier years (from 1900), may be obtained from the Labour Gazette.

These indices may be used for the computation of a composite index, when input costs of the assets are determined. Current costs of an asset may be derived by an index of input costs.

One of the disadvantages of the use of wage rate indices is that they are not computed often enough to be readily used for accounting purposes. In lieu of these, the Dominion Bureau of Statistics' Index Numbers of Payrolls by Industrial Division, may be used. Annual and monthly indices are available for major industrial groups, but these are not as comprehensive as those published by the department of labour.

Price Indices of Electrical Utility Construction

The "index is designed to provide an estimate of the impact of price change on the cost of materials, labour and equipment used in constructing and equipping electrical utilities in a specified base period."¹⁵ The indices are available for distribution systems, transmission lines, and transformation and switching stations. These are input-cost indices, and show price changes of completed structures, only so far as there is a relationship between input costs and the cost of the aggregated structure.

Input cost indices are used because it is not feasible to collect price changes of completed structures, as these have no

¹⁵Canada, Dominion Bureau of Statistics, Price Indexes of Electrical Utility Construction, p. 7.

resale markets.

The aggregated indices have a limited application. Each project may relate to a different mix of materials, labour and equipment, and may be unique in themselves. Therefore, only components of the indices may be used.

Price Indices of Highway Construction in Canada

The Price Indices of Highway Construction are a series of index numbers of prices paid by Provincial and Federal government for construction of highways in Canada--both base and current weighted indices are available. The base-weighted index shows, through time, the percentage change in bid prices (as compared to the base date 1956) of contracts awarded for highway construction. The current weighted index shows the prices paid for construction, in the given year, as a percentage of the cost of the same construction in the price-base year.

Because highways are unique, and because it is impossible to obtain comparable prices through time, certain methods have to be adopted to obtain price data. One way is to price inputs of material, labour and machinery. But, this may fail to include other elements of price of final output, particularly overhead costs including profits and losses. Another way is to use bid prices of portions of work, and to include prices of materials excluded from bid prices but included in construction. This latter approach is adopted for these indices.

By definition, each index measures the effect of price change on the cost of an unchanging or equivalent programme of highways construction, represented by capital construction contracts valued at \$50,000 or more The indexes, therefore, measure only the effect of price changes on the cost of highway construction. They do not reflect changes in the cost of highway construction resulting from non-price changes such as quantities or qualities of highway construction from year to year.¹⁶

The index may be useful in planning for highway construction, and to obtain the current cost of previously costed roadwork.

Comments on the Use of Price Indices for Accounting Purposes

Price Indices as Averages

General price indices, as statistical averages, indicate, on an average, the percentage change in prices of commodities from one point of time to another. For example, the General Wholesale Price Index is an average of prices of some primary and semi-processed commodities; the Residential Building Materials Index measures the average price change for housing costs represented by materials.

General price indices are based on a representative sample of commodities. The sample has to be a good representative of commodities of the whole group for which it is intended. This has to be borne in mind when price indices are used for accounting purposes.

The use of general price indices for accounting purposes, is dependent on the fact that, as averages, they express the purchasing power of the dollar in terms of the commodities they

¹⁶ Canada, Dominion Bureau of Statistics, Price Division, Farm Prices Section, Price Indexes of Highway Construction in Canada (Ottawa: Queen's Printer and Controller of Stationery, 1962), p. 15.

represent. If one is interested in the general purchasing power of the firm, then an index which is representative of prices of all goods and services, like the Gross National Expenditure Price Deflator Index, may be used. If the idea is to measure the firm's investment purchasing power, then a price index related to the investment goods of the enterprise is relevant. Such an index is not available; it has to be computed for the enterprise. Sometimes an index may be used because it has a high degree of correlation with another so as to provide an approximate solution. For example, the Consumer Price Index may have a good correlation with the Gross National Expenditure Implicit Price Deflator Index and may be used in its place.

Base Date and Weights

With the exception of the Gross National Expenditure Implicit Price Deflator Index, and the Highway Construction Price Index (which is both base and current weighted), fixed or base weights are assigned to all price indices for Canada. These indices are easily computed but there is a significant argument against their use. Weights are assigned according to quantities or value of goods purchased at the base date, but the amount of purchases is not likely to remain the same. This is because of: (1) the introduction of new commodities, or the modification and quality changes in old commodities; (2) relative price variations cause changes in the amount of purchases; and (3) the responsiveness of demand to a change in consumer income is likely to differ for different commodities assuming prices of all goods remain the same.

"As time passes and the base period recedes farther and farther into the past, accuracy will continue to decline."¹⁷ This necessitates a continuous revision of the base date and weights.

At the present, there is no common base date for all the price indices available for Canada, though it is the intention of the Dominion Bureau of Statistics to convert the official indices to the 1961 time period.¹⁸ Several price indices are available at the 1949 base date; for example, the Consumer Price Index, and the Non-Residential Price Index, (the Residential Price Index is arithmetically converted to the 1949 base date.) The Wholesale Price Indices are still on the 1935 base date, while the Industry Selling Price Indices, and the Price Indices of Highway Construction, are on the 1956 time reference period. Currently, the Gross National Expenditure Implicit Price Deflators are on the 1957 base date. The Price Indices of Electrical Utility Construction are on the 1961 base date.

Attention must be directed to the different base dates when these indices are used for the adjustment of specific price variations. As the indices do not represent the purchasing power of the same base date, it may be necessary to arithmetically convert these indices to a common base period.

¹⁷Bruce D. Mudgett, Index Numbers (New York: John Wiley & Sons, Inc., 1951), p. 73.

¹⁸Canada, Dominion Bureau of Statistics, Price Index of Electrical Utility Construction, p. 13.

Specific Price Indices and Quality Changes

Several specific price indices are available for the adjustment of specific price changes. A composite index of the Construction Wage Rates, and Non-Residential Building Materials Price Index, may be used for restating the cost of buildings. The unpublished Price Indices of Machinery and Equipment may be useful for restating the cost of machinery and equipment. The Industry Selling Price Indices, and the components of the Wholesale Price Indices, may be utilized for restating the costs of some equipment, vehicles, fixtures and inventories.

The use of some of these indices presents a problem of quality changes. Basically, two approaches are adopted to assess the relative quality of the replaced item and the replacement item for the Machinery and Equipment indices. It can be accomplished by:

- (1) Comparing the relative prices of both items, when they are on the market at the same time. An assumption, here, is that the market has assessed their relative qualities and reflected these in their relative prices.

- (2) As with the Industry Selling Price Indices, it may be possible to estimate the price and quality change of a machine by comparing the input cost of labour and materials. An assumption is that there is a direct relationship between input costs and selling prices at a specific time.

The essence of the method used is to estimate what would have been the price of the old model if it had been currently produced or what would have been the price of the new model if it had been produced in the earlier period.¹⁹

In comparing the input costs of the old and new models, the "extras" are not considered, thus enabling a comparison of basic machines. By these methods, price and quality variations are separated to a certain extent. It should be remembered that there is no ideal solution to the problem of quality change.

Summary

The construction of price indices is dependent on a collection of the sample of goods and services and the choice of a formula. Price indices are valid only if the sample is representative of the universe (the class of items under observation.) Therefore, a careful and proper selection of the sample is important. Frequent revisions may be necessary in the sample because of modifications to existing commodities and from the introduction of new commodities.

The choice of the formula is equally important. The Laspeyres' formula introduces an upward bias and assigns too much weight to quantities in the base period. Most Canadian price indices are based on this formula. The Paasche formula on the other hand, ignores base period quantities. An example is the Gross National Expenditure Implicit Price Deflator Index which employs the Paasche formula. Fixed-weight indices are not affected by either base or current period quantities, instead refer to weights of the selected period. The

¹⁹Ibid., p. 27.

Consumer Price Index for Canada is based on 1957 family expenditure patterns, but has 1949 as the base date. No Canadian price index employs the use of Fisher's formula, probably because it requires a determination of both base and given year quantities, as it is a geometric average of the Laspeyres and Paasche indices.

General price level indices measure price changes in all goods and services. However, the implicit price deflator index is the only index that can be considered a measure of general price level changes. The Consumer Price Index measures price changes of a representative "basket" of consumption goods only, and the general wholesale price index measures the price changes in raw and semi-processed commodities. Limitations of these indices should be noted when they are applied to financial statements. The implicit price deflators do not permit a comparison between one year and another, but only between the base date and the given year, because these indices not only reflect year to year changes in prices but also the changing expenditure patterns. The consumer price index requires a frequent revision in its weighting pattern, because it is less representative of current consumption patterns as it moves further from the base date. The reliability of general price indices is dependent on the proportion of commodities available at both the base and given dates. There may be modifications to existing commodities, and some commodities may have disappeared from the market while new ones were introduced.

Some specific price indices available for Canada may be

suitable for an approximation of current costs. The Building Materials Price Indices together with the Index Numbers of Average Wage Rates may be employed for determining the current cost of buildings. But, because of different methods of construction and the use of materials, individual building costs may differ significantly. Furthermore, an increase in productivity, more than the wage rates, may decrease the selling price of completed construction.

The components of General Wholesale Price Indices and the Industry Selling Price Indices may be relevant in some cases, when prices of specific assets are to be restated. However, specific assets present problems of quality changes. On the basis of asset specifications and the assumption that quality is related to physical characteristics of the asset, input-costs are compared after eliminating the differences due to technology. This provides an approximate measure of quality change and has to be noted when specific price indices are used. In addition specific price indices have to be converted to a common base date for Canada before use.

Some business enterprises may find that the available price indices are inadequate for their purpose. For example there is no price index for land, and the machinery and equipment price index is not yet published. Therefore, business enterprises may still have to depend on manufacturer's price quotations, and on their own computations of relevant price indices.

CHAPTER VI

SUMMARY AND CONCLUSIONS

Purpose of the Thesis

The purpose of this thesis was, (1) to examine the usefulness of historical cost accounting procedures to external financial statement users, (2) to evaluate the proposals of price level adjustments, and (3) to review price indices currently available for Canada with a view of recommending the use of one or more of these. In evaluating the proposals for price level adjustments the objective of the entity for survival and growth was kept in mind, while considering the needs of external financial statement users. I am of the opinion that accounting for the interests of the entity will be favourable to the interests of shareholders, creditors and other interested groups in the long run. Only external reports are considered.

The Dollar and Price Variations

The use of the monetary unit to quantify the economic events of an entity has certain advantages. It serves as a common denominator and simplifies arithmetical operations. Though it is not necessary that a simple common denominator should serve as a unit of measure, its use certainly gives expression to a meaningful relationship among different economic events. This provides an effective means of communication between interested parties. Because of the qualitative content of the monetary unit, it enables the assignment

of values to the resources and obligations of the enterprise. However, the monetary unit is not a constant-value unit of measure, and this is its main weakness. A stated number of monetary units of a few years ago may not compare in value with the same number of units today, or tomorrow.

Since it is the numerosity of prices that is used for the assignment of values, the value of monetary unit itself can be expressed indirectly. As figure 1 in the introductory chapter indicates there is a general tendency for prices in Canada to move upward. More dollars are required to purchase the same quantity of goods and services, indicating a decline in the value of the dollar. But the possibility of an increase in its value should not be precluded. Therefore, the dollar is a variable unit of measure and a method for defining the changes in it has to be found for its effective utilization for accounting valuations.

Prices as a whole may rise or fall in an economy, but in addition, there is always a tendency for individual commodity prices to vary relatively. Individual commodity prices may move in the opposite direction, or in the same direction at varying rates from the general price level. Therefore, to provide a meaningful relationship between the resources and obligations of an enterprise it is inadequate to think in terms of the general value of the dollar. Relative price changes of individual commodities also have to be considered.

Historic Costs and the Need for Information

In spite of changes in the value of the dollar and price variations of specific goods and services, historical costs are given prominence in accounting. Several reasons are often forwarded in favour of historical cost valuations. Legal pressures and the requirements of statutory bodies prescribe certain procedures to be adopted. The need to furnish objective verifiable financial data does not permit radical changes. But, even historical costs are estimates in some cases and are based on the judgments and personal opinions of the processors of information. This introduces bias into financial statements. However, historical costs do serve a purpose. Investors do not provide funds unless management is ultimately accountable to the owners. Therefore, management has a stewardship role and has to report to investors periodically and historical costs provide simple, easily understood financial data.

Historical costs may provide a report of stewardship but may not be of use to present and prospective investors in making rational investment decisions. In the balance sheet assets are usually shown at acquisition costs less depreciation and liabilities refer to obligations contracted at different prices in the past. Both these have relevance to the future in that some of the assets will be utilized to meet obligations while the rest will provide future economic benefits. Therefore, for a meaningful relationship, and for the benefit of present and future investors, the firm's resources and obligations should be stated in units of the same purchasing power.

One of the main purposes of an income statement is to enable investors to predict the income of future years. The conventional measure of income is derived by matching current revenues with past period cost allocations and expenses. This does not represent the economic sacrifice or benefits in a constant unit of measure. Furthermore, the conventional measure of income does not exclude holding gains and losses (due to the variation in the prices of resources held by the firm) from operating profit. Similarly there is no computation of monetary gains and losses caused by price variations in monetary assets and liabilities. Therefore, a conventional measure of income is not likely to assist investors in their appraisal of management and prediction of the income of future years. For prediction of future income, expenses and revenues have to be stated in current purchasing power because past income figures are only useful for prediction if all the income statement figures are expressed in constant purchasing power.

Conventional accounting procedures lead to a financial measure of income. Shareholders cannot be certain whether dividend payments were from earnings or a disbursement of the firm's resources. Only current cost information can lead to a correct measure of income. This allows for the maintenance of the firm's operating capacity and provides relevant information to investors and other financial statement users.

This writer is of the opinion that reports of stewardship should be given a minor role in accounting. Accordingly financial

statements should be adjusted to provide current cost information.

Adjustments for General Value of the Dollar

In considering alternative valuation procedures, some have suggested the use of general price indices to adjust for variations in the value of the dollar, while others favour specific price indices and adjust for price variations in individual goods and services. Other revaluation procedures--replacement values and market prices--are also suggested.

The Gross National Expenditure Implicit Price Deflator Index measures price changes in all goods and services in an economy and is reciprocal of the value of the dollar. It is considered reliable enough for accounting purposes but it presents a community approach to the problem. It is the only available index that measures the value of the dollar but its use for restating specific assets for the firm is doubtful. Investors are interested in particular resources of the firm and not in their general value. They require accurate information for evaluating management. Moreover, it is a currently weighted index and cannot be used as a continuous series. It enables a comparison of the base period with a given year only because it includes not only the year to year changes in prices but also the changing expenditure patterns.

General price level enthusiasts, (as noted in chapter III) sometimes recommend the use of the Consumer Price Index as a measure of the price level because of its availability and close correlation with the implicit price deflator index. Utilization of

the Consumer Price Index implies a proprietorship approach to the problem and also an acceptance of the idea that it is the shareholders consumption purchasing power that is being maintained. But shareholders are investors, and when considered in this context the use of the Consumer Price Index is inappropriate. Financial statements are not the right place to account for their consumption purchasing power because other groups are also interested in the resources of the enterprise. Although shareholders may be interested in increasing their future consumption, they are essentially making investment decisions; therefore, it is investment resources and their specific purchasing power that interests them. Moreover, the Consumer Price Index does not represent an area of common experience for all investors.

The General Wholesale Price Index is a measure of price changes of raw and semi-processed commodities and is not suitable for specific price adjustments.

General price level adjustments are merely restatements in terms of general purchasing power and not a departure from the cost basis. These enable the enterprise to maintain its historic investments. Operating capacity of the firm is not considered. Therefore, to aid the enterprise in its struggles for continuity and also to provide economic information to financial statement users, general price level adjustments are certainly not the answer.

Adjustments for Specific Price Changes

Those who advocate adjusting for specific price changes view the problem in different perspectives, (see chapter IV). Hendriksen views the problem as one of maintaining investment purchasing power. After considering the economy, the industry and the firm's investment indices, he recommends the use of the economy index for the United States. Perhaps this may be appropriate for the United States, but the writer is of the opinion that adjusting for price changes in specific assets with specific price indices or market prices will be more significant than adjusting with an overall economy investment index or even the firm's investment index. The overall investment index may not be applicable to the particular resources of the firm because of its widespread interests internationally or within a specific geographic area of the country. The firm's investment index may be applied to monetary items like cash or receivables but specific price indices applied to the firm's resources will provide more accurate information.

Replacement costs are sometimes considered as possible candidates for revaluing specific assets. These can be current costs of replacing an identical asset, or an asset of equivalent capacity, or even costs of eventual replacements. Replacement cost accounting considers profits as a residual after physical assets or the firm's operating capacity is maintained. The basis is to provide an exact amount for the eventual replacement of an asset. The replacement cost concept can be applied during periods of stable

prices. It does not account for the asset in use and implies contemplated action which may not materialize.

Market buying prices and specific price index investments also aid the firm in maintaining its operating capacity and provide current cost information to investors. It was observed that the use of specific price indices produce close approximations to replacement costs, as these still refer to past market conditions and prices. Therefore, where possible current market buying prices should be employed for revaluations. These are objective and reflect the current cost of securing the same service as the asset in use.

Market resale prices imply the scrapping of an asset, or the disposal of the firm's resources. This reflects a venture idea rather than one of continuity. Market buying prices on the other hand reflect the firm's opportunity cost if it did not own the assets and the current cost of the asset in use. Therefore, market buying prices are preferred to resale prices when current costs are to be stated. Specific price indices may be used where market buying prices are not available.

Several specific price indices are available for Canada, in addition to the general price indices, (See Chapter V). Current costs determined by the use of price indices are approximate solutions and are bound to be inaccurate. Certainly approximate solutions are better than no solution at all, but translating the monetary unit into some average concept means introducing some degree of uncertainty and difficulty in comprehending accounting data.

Price indices are objective and verifiable and may be preferred to historic costs for some degree of relevant information. But the writer does not wish to be a strong advocate of employing price indices for accounting purposes. Other revaluation procedures, perhaps market buying prices could prove more useful. Where these are not available an estimate of the current cost of an asset of equivalent service, or specific price indices may be used.

Conclusion

In considering the usefulness of financial reports to external financial statement users the following observations may be noted:

(1) Historical cost accounting should not be given prominence in external reports.

(2) Financial statements should be adjusted for price level changes.

(3) The Gross National Expenditure Implicit Price Deflators or the Consumer Price Index may be used to adjust for general purchasing power. But the writer prefers adjustments for specific price variations either with current market buying prices or with specific price indices, or an estimate of current cost of an asset of equivalent service may be considered.

(4) It may be necessary to use the investment purchasing power index of the firm to adjust monetary items.

(5) Replacement value accounting is not recommended because of practical difficulties in the application of the concept and because

the concept reflects an idea of eventual replacement rather than accounting for current resources of the firm.

(6) Price indices though objectively verifiable are averages. Therefore one should rely on current market buying prices or current costs of an asset of equivalent service.

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